THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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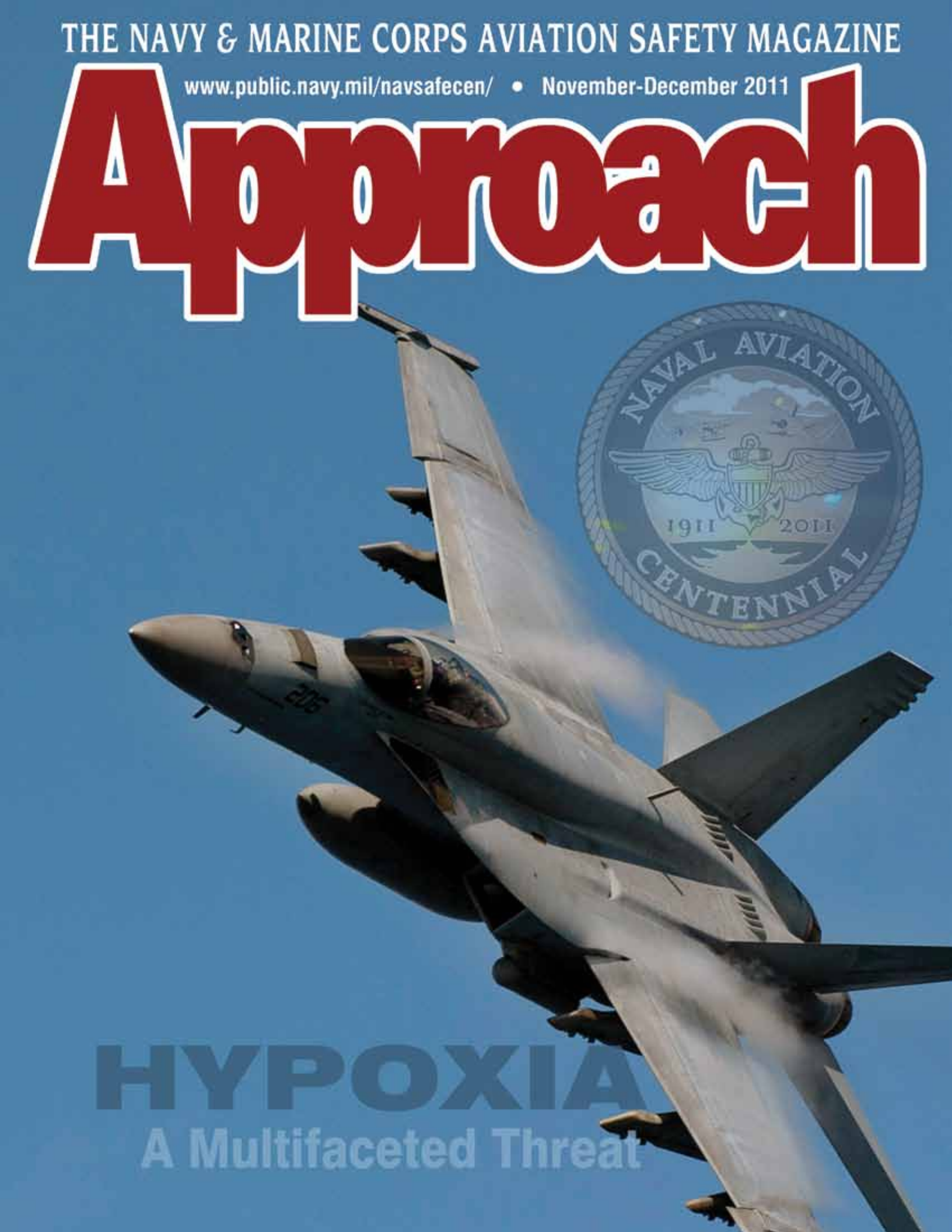
Approach



HYPOXIA
A Multifaceted Threat

The Navy & Marine Corps Aviation Safety Magazine
November-December 2011 Volume 56, No.6

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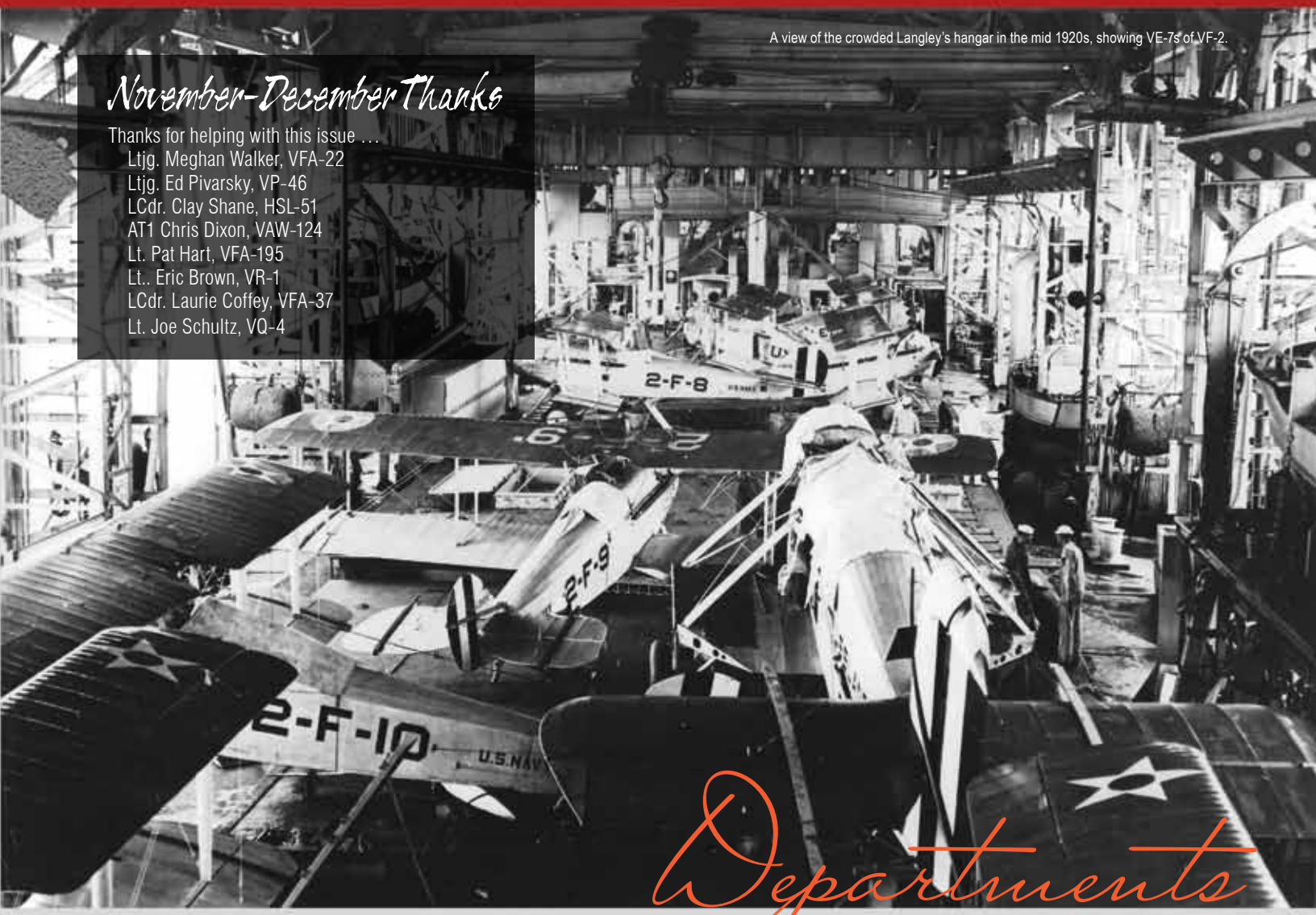


A view of the crowded Langley's hangar in the mid 1920s, showing VE-7s of VF-2.

November-December Thanks

Thanks for helping with this issue …
Ltjg. Meghan Walker, VFA-22
Ltjg. Ed Pivarsky, VP-46
LCdr. Clay Shane, HSL-51
AT1 Chris Dixon, VAW-124
Lt. Pat Hart, VFA-195
Lt.. Eric Brown, VR-1
LCdr. Laurie Coffey, VFA-37
Lt. Joe Schultz, VQ-4

Departments

Front cover: An FA-18E Super Hornet with VFA- 81. Photo by MCS2 James R. Evans.
Back cover: Sailors aboard the USS *Carl Vinson* (CVN 70) attach cargo to the underside of an SH-60B Sea Hawk. Photo by MCS2 James R. Evans. Modified.

The Initial Approach Fix

The Road Ahead

Rather than writing an "Initial Approach Fix," my comments are more appropriately titled "Final Approach Fix," as it will be my last as I head off into retirement and must pass the reigns of your Director of Naval Aviation Safety to Capt. Chris Saindon.

As I look back on my 30 years of service and I compare it to my two years at the Naval Safety Center, I reflected on the similarities between the two eras. Both have had incredible highs and extremely challenging lows. For aviation safety, an incredible high was achieving the lowest mishap rate in Naval Aviation history in FY10, with a combined rate of 0.89 (USN.78, USMC 1.46), the low point was the loss of 14 aviators and aircrewmen.

FY11 looked like it would be an even better year until the final two months of the reporting period when a spate of mishaps drove the USN rate to .96, with the green side climbing to 2.47. I had a meeting with my Code 10 professionals and expressed my concern that we were on the reactive side of the fence instead of the proactive. Our focus is shifting to the root causes of not just the causes generating Class As, but the Class Bs and Cs, which are the harbingers of mishap severity escalation. We must dig deeper and ask the tough-to-answer questions: Is our training adequate? Is fatigue becoming a major factor with the aircrew and maintainers? Is the equipment getting long in the tooth after 10 years of combat? Are budget reductions starting to have an adverse effect on proficiency?

Naval Aviation's primary mission is combat effectiveness, putting bombs and bullets on target. Operational safety comes as a subset of a quality organization. We must be an organization that preaches, and more importantly, practices the tenants of ORM and CRM.

The professionalism of our aviation community has never been better — dedicated, professional and hard charging — tigers all and continually improving. Understanding and practicing risk and crew resource management are part of our culture. Our Naval Safety Center team and safety folks throughout the fleet, beginning in the training commands, have inculcated this way of thinking, behaving and doing, into our work and play — and that is good.

In closing I wanted to thank the entire Safety Center Team (including the ASOs) for doing such great work on a sometimes thankless task. You are professionals in every sense of the word. I especially thank my deputy, Kimball Thompson, the true "Burning Bush" for his loyalty and support. We are a better organization because of his total dedication. I would be remiss if I didn't thank Jack Stewart, the *Approach* editor for his selfless efforts in producing such an informative and eye-opening magazine. As I call "on final," I encourage you to keep stroking, make your own luck, stay focused and may you always land with the wheels/skids in the right direction and the shiny side up. Z-man out

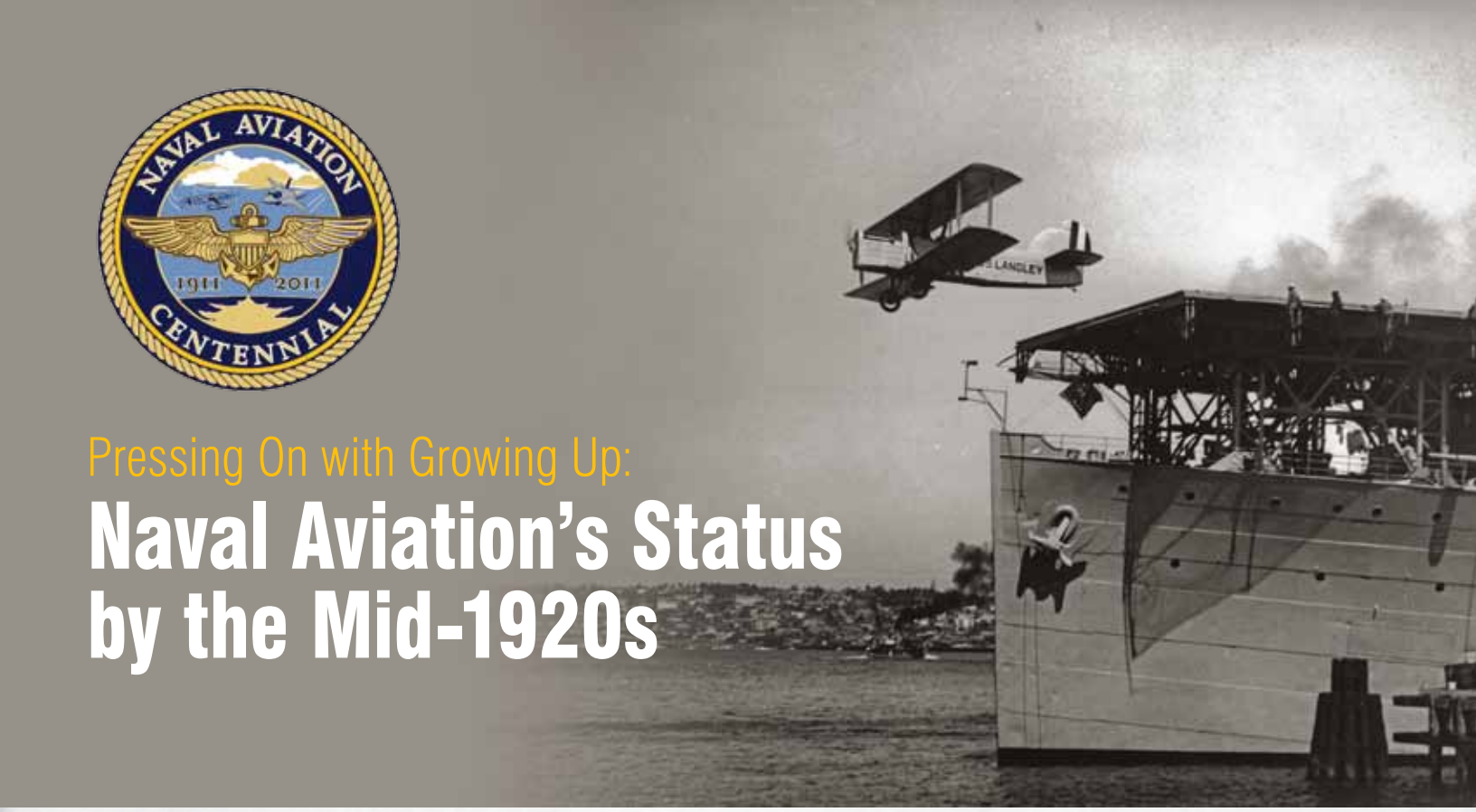
PS. GO PACK GO!

Safety Awards

How are your end-of-calendar-year, safety-award nomination packets doing? It's time to nominate your command and be recognized for a solid year of accomplishments. Command excellence through safety is at the core of Naval Aviation, and the following awards will showcase high achievements: CNO Aviation Safety Awards, Naval Aviation Readiness Through Safety Award, Admiral James S. Russell Naval Aviation Flight Safety Award and the Admiral Flatley Memorial Award.

Don't forget the highly coveted Grampaw Pettibone Awards, with unit and individual categories that recognize promoting safety through publications (such as *Approach* and *Mech*), and the media category (unit or individual) for the use of digital and media resources (such as videos and websites) to promote aviation safety.

The reference is the CNO Aviation-Related Safety Awards, OPNAVINST 1650.28A.



A Douglas DT torpedo bomber launches from the USS *Langley* in April 1925. Note that the ship is at the pier, not under way.

Pressing On with Growing Up:

Naval Aviation's Status by the Mid-1920s

BY PETER MERSKY

In this series of articles, we've looked at people and events in the first two decades of Naval Aviation. During these 20 years Naval Aviation and its people experienced the highs and lows, successes and failures of this new endeavor—flying from ships, initial combat, development and improvements—that promised more to come. There were more than a few dividends, but in general, by the time America's first carrier joined the fleet, Naval Aviation was well on its way.

Carriers and shore-based communities—ASW, transports, even early experiments in vertical flight and supply, and even very basic aerial refueling—promised so much more.

Safety considerations, while always given proper lip service, were really addendums in the days of two wings, doped linen and mazes of inter-wing braces and wires. Without the formal, enforced programs we take for granted in the early 21st century, Naval Aviation could be a very dangerous profession.

Personal parachutes, which had appeared by the end of World War I—not counting those used by balloon observers on both sides—were used by German aviators, not Allied pilots. Aircraft radios, also appearing by 1918, were gradually becoming part of an aircraft's regular equipment. Large mast-like antennas were prominently placed behind the cockpit to aid the heavy single-channel, short-range sets that rode behind the pilot.

A largely overlooked area was aviation medicine. Doctors were realizing they had to specialize in their arena, not just check out an aviator's cold or see if he got dizzy in a spinning chair. Concerns like night flying and flying by instruments in bad weather, the effects of G forces as aircraft achieved higher speeds, and the effects of high-altitude flight were all part of the menu as aviation moved through the 1920s and 1930s. Cockpit pressurization and the development of specialized high-altitude flight gear—oxygen masks, special head gear, even gloves and boots—were all part of this unique period.

Check out the 1941 film "Dive Bomber," starring Errol Flynn and Fred MacMurray. Although beyond our timeline here, this beautifully photographed movie features some gorgeous color sequences of then-current Navy aircraft while telling the story of a flight surgeon's (Flynn) desperate attempts to develop a high-altitude flight suit. It's also interesting, in a macabre manner, to see all the safety violations of the period, the worst of which is all the chain smoking by the actors—even the flight docs--especially on the flight line! During fueling! Followed by covers worn on the flight line and flight deck. How far we have come in those 70 years.

Billy Mitchell vs. the Navy

During this time, the Navy encountered several problems that helped shape the future of its aviation component. One was human, the other more mechanical. William L. Mitchell was one of Army aviation's early whiz kids. Aggressive and totally committed to his profession, he had quickly risen to brigadier general during World War I, and just as quickly made a lot of enemies in the Army and the Navy for his out-spoken attitude in promoting his service's role in the future of flight.

His main argument was that the Navy's surface ships were obsolete—the submarine was where the Navy should be focusing its efforts—and that all aviation assets should be placed under one service, his, of course. He

BGen Mitchell faces charges during his court martial in 1925. The outspoken aviator had stacked the deck with his constant castigation of policies and superiors. Yet, his own crusade to propel aviation into the foreground ultimately was exonerated during World War II.

proceeded to prove his point about ships through a series of exercises off the Virginia Capes in July 1921. With old American ships and a few German vessels as undefended targets, he led a group of Army bombers—the Navy also contributed its share of attack planes—against the anchored warships. Several of the derelicts were, indeed, hit and sunk, and Mitchell's point seemed to be proved. Of course, there was no defensive fire or maneuvering by the targets. In his 1925 book *Winged Defense*, he proclaimed, "It is practical to do away entirely with the surface battleship." Naturally, his words did not sit well with Navy admirals.

In truth, Mitchell was not alone. There were many Navy leaders who agreed with him, though not as publicly or as loudly. Our scope here is much too brief to fully tell the Mitchell story. Suffice it to say, his star burned quickly and after several highly publicized comments at the expense of his superiors, as well as the Navy, he faced a court martial, which many thought was supported by the dour President Calvin Coolidge.

Ultimately, this bold prophet of air power was found guilty, reduced to colonel, and sent off in disgrace. He died in 1936 before seeing many of his theories proved in World War II. The Army tried to rectify his disgrace by awarding him a rare peacetime Congressional Medal of Honor, and naming its B-25 medium bomber, one of the war's iconic aircraft, after him. (The revered Medal of Honor, normally, but not always, awarded for service in combat is often mistitled "Congressional," but isn't.)

Again, look for a movie, 1955's "The Court Martial of Billy Mitchell," starring the equally iconic Gary Cooper. A little slanted toward its subject, with a few liberties with the facts, but worth your time.

LTA Has Its Day

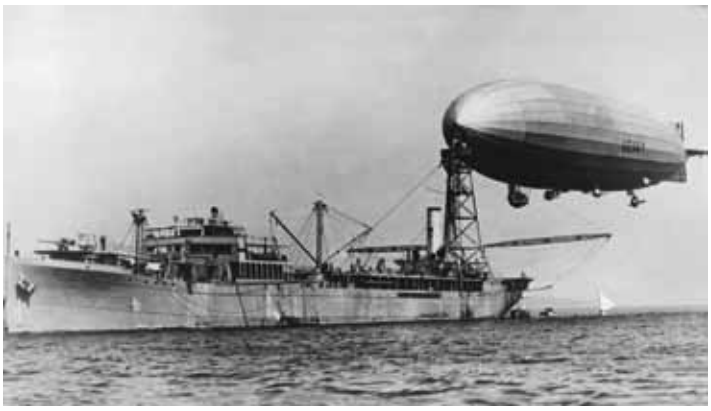
One of the events that brought the Mitchell matter to a head was the crash of the U.S. Navy airship USS *Shenandoah* (ZR 1) on September 3, 1925. The large dirigible had encountered bad weather—its skipper LCdr. Zachary Lansdowne had pressed on with his launch orders—and had gone down with a large loss of life. Lansdowne was a long-time friend of Billy Mitchell, and the Army general quickly took the Navy to task for the tragedy. Heading out to an air show, Lansdowne was uneasy about the weather forecast along the route. All the warnings were there, but anxious to meet his arrival orders—his superiors didn't leave him many options, either – he launched. Get-there-itis was alive and well, even then.

Lighter-than-air (LTA) operations had played a minor though colorful part in World War I, mainly from German airships flying 51 raids against England and dropping 5,806 bomb totaling 196 tons. These attacks killed 557 people and injured 1,358. In response to this offensive, the British kept 12 first-line fight squadrons home when they might have been more effective in France.

Post war, heavier-than-air (HTA) aircraft having restricted endurance, long-range missions, such as coastal, or maritime patrol, went to the Navy, with its large, multi-engine flying boats and, increasingly, to its slowly growing fleet of LTA blimps and rigid airships, such as the *Shenandoah* (ZR 1). Originally filled with highly volatile hydrogen, the big bags were slowing transitioning to inert helium.

ZR 1 (Zeppelin Rigid No. 1) made its first flight in September 1923, and in the following months, it had made several flights and had participated in fleet exercises. *Shenandoah* — an Indian name meaning "Daughter of the Stars" — was based on a German Zeppelin design. Zeppelins had been the most successful wartime airships and had been created by Count Ferdinand von Zeppelin at the turn of the 20th century.

Almost two years to the day from her first flight, she left NAS Lakehurst in the mid-afternoon of September 2, 1925, under the command of Lieutenant Commander Lansdowne, and headed west. By dawn on the 3rd,



The USS *Shenandoah* on the mooring mast of the USS *Patoka* (AO 9), 1926. The *Patoka* was a fleet oiler that became the tender for the large dirigibles.

she was over eastern Ohio, near Marietta, where she ran into a violent storm with winds of up to 72 mph that broke the dirigible into three parts, scattering debris over the countryside. Although 29 of her crew survived, 14 were killed, including her CO.

Billy Mitchell's pronouncements after the crash and loss of his friend, Lieutenant Commander Lansdowne, added fuel to the fire of his court martial. However, Lansdowne's widow testified that her husband had been against the flight because the *Shenandoah* needed refurbishment before undertaking such a long flight. Her words seem to support the Army general's castigation of Navy leadership, thereby weakening the prosecutor's case. The seeds of doubt had been planted in the public's mind about LTA.

Also, the question of how important it was to send the big dirigible so far out for a public display was verified to a degree and held up as good training for the crew. You can probably draw your own conclusions and perhaps apply them to today's missions and weather forecasting, which, of course, has the benefits of 86 years of scientific improvement.

Airships enjoyed a somewhat checkered career with several more being lost before World War II. Certainly, during the war, airships served in useful roles, especially escorting vulnerable Atlantic convoys as they made their dangerous way to Europe with vital supplies for America's allies, mainly Great Britain and the Soviet Union.

However, after the war, with long-range HTA patrol aircraft in the fleet and under constant development, the LTA mission was soon in jeopardy and by 1961, it had been terminated.

Two other important military events of the early 1920s involved Naval Aviation. First, the Bureau of Aeronautics was formed, with RAdm. William A. Moffett at the head, on September 1, 1921. Moffett was a strong advocate of Naval Aviation, particularly LTA. He had received the Medal of Honor for surface action at Vera Cruz in 1914, a time when he was not yet an aviator. He would provide a strong measure of leadership, which Naval Aviation certainly needed, as well as a formidable opponent to General Mitchell. Unfortunately, Moffett died in the crash of the USS *Akron* (ZRS 4) in April 1933 while on a flight from Lakehurst to New England.

The second milestone of the period for Naval Aviation was the so-called Washington Conference, which created a limitation of armament, coming three years after World War I. The main thrust of the conference led to eventual limitations of the size and type of ships the U.S., Great Britain and Japan, the three primary world maritime powers, could build. It set the tone for the entire inter-war programs of capital ships, including carriers. Signed on February 6, 1922, the Washington Treaty affected the construction of the next two American carriers — the *Lexington* (CV 2) and the *Saratoga* (CV 3) — which were eventually commissioned a month apart in 1927.

The crew aboard USS *New York* (BB 34) hoists a Vought floatplane aboard, a common sight during the 1920s.

Mitchell's Navy opponent, RAdm Moffett looks a little uncomfortable in his blues and a harness. He is going flying in a Douglas DT at Honolulu in August 1925.

As the decade of what became known as "The Roaring Twenties" reached its mid-point, military aviation was on a drive that knew no brake. Naval Aviation was strapped in and it, too, saw new developments in achievements, aircraft, ships and strategies. We would need it all for the coming years would offer more accomplishments as well as the bloodiest, most costly war in history.

MR. MERSKY IS A FORMER APPROACH EDITOR AND HAS WRITTEN SEVERAL BOOKS AND ARTICLES ON NAVY AND MARINE CORPS AVIATION. HE IS ALSO A RETIRED NAVY RESERVE COMMANDER.

Hypoxia—A Multifaceted Threat?

BY LCDR. T.E. SATHER MSC, CASP

"THERE I WAS … " is a typical start to discussions with aviators sharing their knowledge. In the case of hypoxia, stories normally involve failure of an on board oxygen-generating system (OBOGS) or loss of cabin pressurization. The tale includes their symptoms and how they made it back. They may remark how the signs or symptoms were like what they experienced in an Aviation Survival Training Center's low-pressure chamber or during a reduced-oxygen-breathing device (ROBD) sim flight. One thing is for sure: Hypoxia remains a concern for everyone involved in flight safety. Many recent problems involve FA-18 aircrew.

The first hypoxia-related casualties were reported in 1878 by French physiologist Paul Bert as balloonists traveled high into the atmosphere.

Webster's dictionary defines hypoxia as an abnormal condition resulting from a decrease in the oxygen supplied to or utilized by body tissue.

Hypoxia is dangerous because it impairs cognitive and physical performance, sometimes without the flight crew realizing anything is wrong. It's difficult to predict at what altitude behavioral disturbances will occur or how long a person must be exposed to a particular altitude before the onset. Experiences may differ for the same pilot on different days. However, if you've ever ended a flight exhausted or with a headache, your body may be telling you it needed oxygen, regardless of the altitudes you flew.

I don't have to prove to you the dangers of hypoxia; we all know that it is unpredictable, insidious and deadly. I do want to present new information to help you see how hypoxia may affect your performance.

Although the four types of hypoxia may be encountered in flight, hypoxia normally refers to altitude-induced or hypoxic hypoxia. During the flyer's annual or refresher training, he/she may be reminded that there are three other kinds of hypoxia. We don't give them a great deal of attention, as they are just not that important to us flying. Truth be told, we are seeing that hypoxic episodes have a large number of contributing factors that add up over time. It's not as simple as when you played the "Pensacola patty-cake" and were on-guard for the signs and symptoms.

Everyone becomes hypoxic to some degree when exposed to decreased partial pressures of oxygen at altitude. Other factors beyond atmospheric pressure can cause people to react as they would at higher altitudes, even though they are at sea level. These additional factors,

... we are seeing that hypoxic episodes have a large number of contributing factors that add up over time. It's not as simple as when you played the "Pensacola patty-cake" and were on-guard for the signs and symptoms ...

combined with the environmental factors, create a person's physiological altitude (the altitude the body feels it's at). For example, smoking three quick cigarettes before takeoff or smoking 1 to 1.5 packs a day raises your physiological altitude by 2,000 feet because of high baseline levels of carboxyhemoglobin.

In aviation, hypoxia typically occurs as a result of a fall in partial pressure of oxygen in the inhaled air with increasing altitudes. Hypoxia can impair judgment, memory, alertness, coordination, and the ability to make calculations. There are four types and a person can be simultaneously affected by all four.

Hypoxic Hypoxia: This can occur due to reduction of a partial pressure of oxygen in the air you breathe, or conditions that decrease oxygen to the brain.

Anemic or Hypemic Hypoxia: This results when there is a reduction in oxygen-carrying capacity of the blood because of decreased hemoglobin content, commonly due to poor nutritional state or blood loss/donation. Carbon monoxide, nitrates, or sulfa drugs could form stable compounds with hemoglobin and reduce the amount of hemoglobin available.

Stagnant or Hypokinetic Hypoxia: This form of hypoxia is due to a malfunction of the circulatory system where the oxygen-carrying capacity of the blood is adequate but there is inadequate circulation. Your foot falling asleep is an example. Imagine the effects if your brain goes to sleep. In aviation, pooling of blood in lower limbs during air-combat maneuvers (positive G acceleration) would predispose a pilot to stagnant hypoxia.

Histotoxic Hypoxia: This occurs when the utilization of oxygen by the body tissues is interfered with. Alcohol, narcotics and certain poisons such as cyanide interfere with the ability of the cells to make use of the oxygen available to them even though the supply is normal. Most of us are smart enough to stay away from narcotics and cyanide. Beware of alcohol, too. Studies show one ounce of alcohol equates to about 2,000 feet of physiological altitude because it interferes with oxygen uptake and metabolism at the cellular level (not to mention the depressant effects on behavior that further clouds the recognition of hypoxia).

Anytime you are dealing with technology, complacency becomes an issue. Technology makes our lives easier. We've been told the technology in the aircraft

is smarter than we are, so if it's telling us something, it's for a reason. We easily accept this information when everything is happening as we expect it, but we also tend to ignore it when it doesn't. When this situation occurs, we often spend a great deal of time working the issue and get task-fixated trying to solve it.

However, in situations where there are frequent warnings (habituation) like an OBOGS-degrade caution, we are not immediately concerned. Why? Because the caution had been seen on more flights than could be remembered. It normally appears because a pilot or WSO took off his or her mask and had forgotten to turn off the oxygen-flow knob. In this scenario, we use precious time of useful consciousness (TUC) trying to figure out if this is an actual emergency rather than acting as if it is.

One of the more insidious forms of hypoxia is actually a chemical poisoning. OBOGS uses bleed air to make usable oxygen through a series of chemical reactions and filters. The problem with this chemical-soup creation is that sometimes it doesn't go as planned. Carbon monoxide poisoning was thought to be one of the most dangerous possible contributing factors leading to hypoxia involving OBOGS. We are now seeing that it may be more complicated than that.

What are some of the issues that muddy the water in determining hypoxia incidents? There are several, but let's focus on three: fatigue, motion sickness and nutrition.

A PERSON WHO IS FATIGUED mentally or physically typically tolerates hypoxia poorly because they already border on a performance decrement. The effects of fatigue include decreased vigilance, concentration and attention span; alterations in judgment and decision-making ability and accuracy; slowed reaction times; and even memory loss. Periods of micro-sleeps may last four to six seconds, and you may not realize you've dozed off. Studies show that being awake for more than 20 hours results in an impairment equal to a blood-alcohol concentration of 0.08 percent. Because fatigue is a symptom of hypoxia, it becomes increasingly more difficult to tell whether symptoms are due to hypoxia, fatigue or a combination.

Motion sickness is a broad category of symptoms that revolve around sensory mismatches that can affect flight performance, safety of flight and even one's motivation to fly. About 50 percent of aviators experience airsickness at some time in their career and the rate is higher for NFOs (85 percent). Air sickness does not always result in vomiting. General fatigue, malaise (feeling "out of sorts"), sweating and headaches are all symptoms of motion sickness. It becomes obvious that these motion-sickness symptoms can greatly muddy the waters due to both the similarity with hypoxia symptoms, as well as the compounding effects of motion sickness on an aviator who is suffering from hypoxia.

Nutritional factors can also play a role in mimicking and exacerbating symptoms caused by hypoxia. Nutrition and nutritional supplements have effects on G-tolerance. You feel tired, sleepy or sluggish a half hour after eating because that is about how long it takes for your small intestine to start digesting. Where the blood goes, so goes the oxygen and glucose. The consequence is energy deprivation of the rest of your body. Even though brain functioning is not affected, this should not be understood as functioning optimally. The lethargy manifests itself as decreased situational awareness and difficulty concentrating.

To avert that tired, sleepy or sluggish feeling, you could try eating smaller meals more often, or continue to plan on a rest-stop post meal. Food and water intake is intimately related to your energy levels. What should you eat to optimize your energy level? Complex carbohydrates, protein, and foods high in vitamin B, iron and magnesium. Drink lots of water. Complex carbohydrates such as those found in whole grains are absorbed slowly by the body, thereby keeping energy levels stable. Whole grains are also rich in B vitamins, which have been shown to boost energy. Fiber slows digestion and provides a steady stream of energy. Protein boosts certain chemicals in the brain that help to increase energy and mental focus.

Navy medicine is constantly striving to make sure we keep the spear strong and the blade sharp. As a force multiplier, we use science and technology to assist the war fighter in winning the fight, prevent losses due to mishaps and hostilities, and to ensure survival of all.

Stay vigilant for not only the threats in the air, but also those involving air.

LCDR. SATHER IS THE ASSISTANT DIRECTOR OF TRAINING, MSC AND HM TRAINING PROGRAMS HEAD, NOMI COMMAND HIGH RISK TRAINING SAFETY OFFICER, NAVAL AEROSPACE MEDICAL INSTITUTE.

Survive Hypoxia

BY LCDR. CHRISTOPHER COOPER

When aircraft O2 systems and aviation life-support systems are all functioning and fitted, and NATOPS rules are followed, the body is supplied with the oxygen it needs to perform. Unfortunately, when one or more of these conditions are not met, the detrimental symptoms of hypoxia could overcome flight personnel if not identified in time. The best way that the Naval Aviation Survival Training Program (NASTP) can address this issue is to subject the aviators and aircrew to hypoxia so they may better identify the symptoms inflight.

The first altitude training unit was established in June of 1941 at Naval Air Station Pensacola. Their mission was to indoctrinate all aviation personnel in the use of oxygen and oxygen equipment, and in the physiological and psychological effects of hypoxia. Since then, naval aviators have been experiencing the symptoms of hypoxia and viewing its detrimental effects as time of useful consciousness approaches zero.

The NATO STANAG 3114 states that all indoctrination flight personnel shall experience the effects of changing ambient pressure and perform the techniques for normalizing the pressure. This hypobaric

THE REDUCED OXYGEN BREATHING DEVICE (ROBD) .

Over the last decade, Naval Safety Center statistics have shown a significant increase in the number of reported hypoxia-related events.

exposure provides exceptional training for initial students, but adds unnecessary risk to refresher students when they return for their required training every four years. Injuries to gas-containing spaces within the body and decompression sickness have always been unfortunate side effects to a small percentage of the students who enter the hypobaric chamber. In addition, training to platform-specific NATOPS emergency procedures had never been addressed until recently.

In 1999, researchers at the Naval Aerospace Medical Research Laboratory developed a device that could induce hypoxia using mixed gas delivered through an aviator's oxygen mask. In 2006, the Naval Survival Training Institute outfitted all eight of the Aviation Survival Training Centers (ASTCs) with this new hypoxia training device: the reduced oxygen breathing device (ROBD). Currently, each ASTC has four ROBD trainers that it uses for mask-on hypoxia training for all TacAir and training platforms. Using flight-simulation software, full 3D cockpits for the FA-18, EA-6B, AV-8B, T-45C, T-6A, T-6B and MV-22 are available to practice platform-specific NATOPS emergency procedures.

THE ROBD HAS TRANSFORMED the way we train by incorporating all of the benefits of the hypobaric chamber without the high-risk environment, while also taking training fidelity and specificity to a much higher level. In addition, the Air Force, Army and many international armed forces have purchased the ROBD for their training programs.

Over the last decade, Naval Safety Center statistics have shown a significant increase in the number of reported hypoxia-related events. At the same time, we have seen a decrease in Class A mishaps due to hypoxia. This data could be attributed to the increased number of issues with aircraft oxygen systems and/or the increase in fleet awareness and recognition of this aeromedical threat. This emphasizes the impact that ROBD training has had on fleet safety and the importance of continuing this training in the future.

The recent change to the OPNAVINST 3710.7U requires annual hypoxia training for all TacAir aircrew. Because of the favorable response from fleet aviators of ROBD training at the ASTCs, and the device's small footprint and mobility, supplemental training in fleet simulators has been implemented to meet this requirement. The simulator operators perform the job of the air-traffic controller, while the aerospace physiologist monitors the physiologic data and supplies the 100 percent O2 for safe recovery once the appropriate emergency procedures are performed. Currently, aeromedical safety officers (AMSOs) at COMSTRKFIGHTWINGPAC, COMVAQWINGPAC, COMSTRKFITWINGLANT, CNATRA, and 1st, 2nd, 3rd and 4th MAW can conduct this training. NSTI also has a mobile training team that travels to the CNATRA training wings to provide training every year. The team is available to assist other wings and can be reached by contacting NSTI.

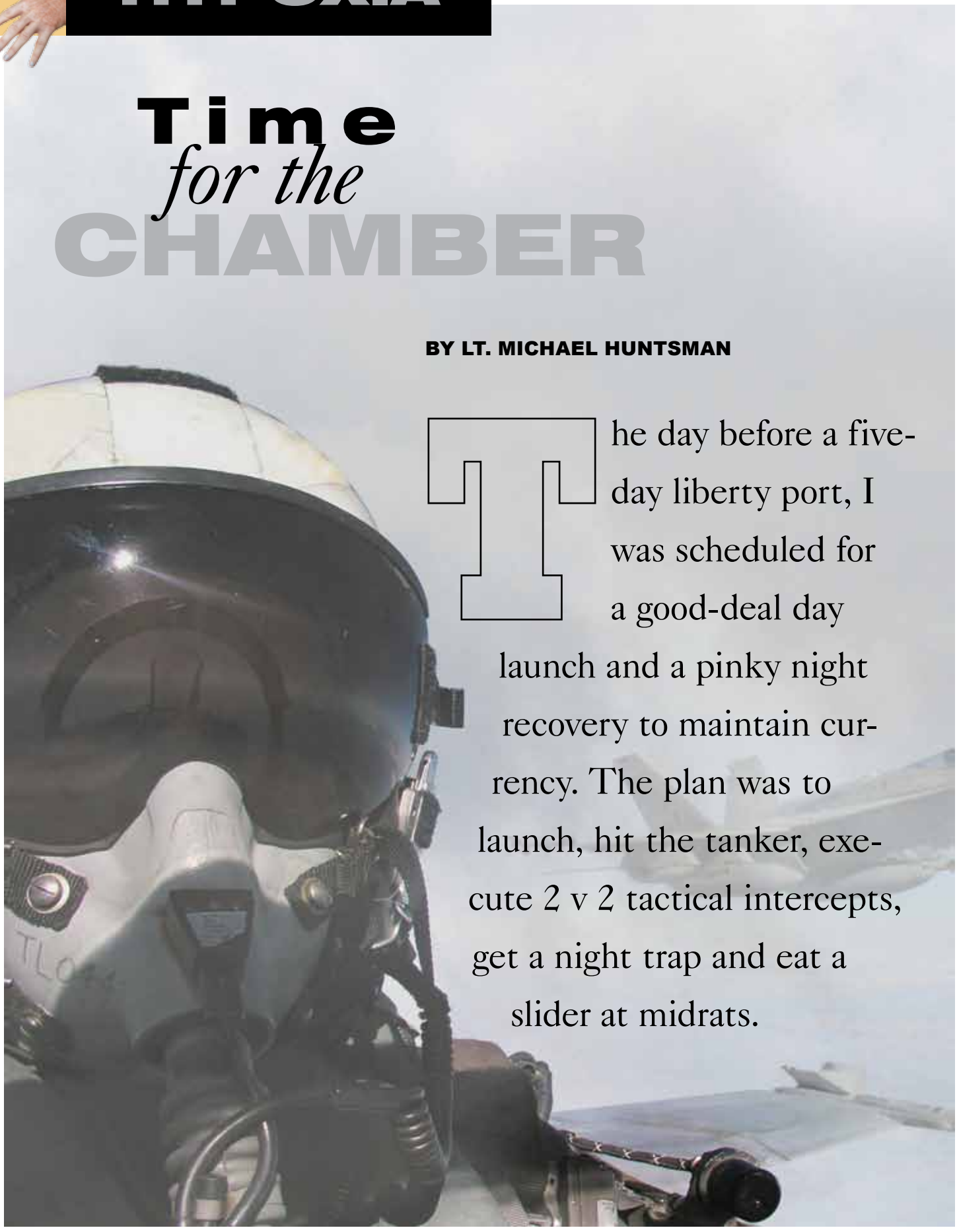
Building upon the success of the ROBD, NSTI is developing a training device using similar technology for multi-place aircraft aircrew. Hypoxia tents have been used for years by runners, cyclists and triathletes. These enclosures create a normobaric environment with an equivalent altitude up to 30,000 feet, while completely removing the risks associated with a hypobaric environment such as sinus injuries and decompression sickness. By placing flight stations configured as Navy/Marine Corps multiplace aircraft, we can create the same high-fidelity training scenarios that the TacAir aircrew have enjoyed.

Captain Jeff Andrews, NSTI OinC states, "The high altitude environment is a dangerous place to operate. Unrecognized and untreated hypoxia results in loss of life and aircraft. Current hypoxia training at NSTI has evolved over many years. We apply state of the art technology and operational relevant procedures with fleet lessons learned in the safest environment possible. Fleet commanders have credited ROBD training with saving four aircrew and aircraft this past year. NSTI will continue to be at the forefront of training warfighters to survive the physiological hazards that exist with flight."

LCDR. COOPER IS THE DIRECTOR, HUMAN PERFORMANCE AND TRAINING TECHNOLOGY, NAVAL SURVIVAL TRAINING INSTITUTE.

Time *for the* CHAMBER

BY LT. MICHAEL HUNTSMAN



The day before a five-day liberty port, I was scheduled for a good-deal day launch and a pinky night recovery to maintain currency. The plan was to launch, hit the tanker, execute 2 v 2 tactical intercepts, get a night trap and eat a slider at midrats.

My lead had received his gas from the tanker and was heading toward our briefed combat-air-patrol (CAP) point. I should have known things weren't going to go well when I had to join-up on my tanker in the clouds. I took 2,000 pounds from the tanker and got comfortably above my fuel ladder. When I got outside 10 miles from the carrier, I started a military-power climb toward our CAP. The weather was solid up to 21,000 feet, so I was instruments only until on top of the clouds.

Once on top, I transitioned to an outside scan and continued to climb. While still at military power and at about 28,000 feet, the environmental control system (ECS) surged. My ears popped, and I had trouble breathing. I can't fully recount all that transpired, but I do remember feeling lightheaded and disoriented. This feeling lasted for about 10 seconds, and then normal oxygen and ECS flow resumed. Still climbing at military power, the surging happened again about 30 seconds later, and I again felt lightheaded and dizzy. This time the feeling remained even after the flow became normal. I could only focus on one thing: aviate.

My lead called, "Fenced in," and I echoed that call while the ECS surged one more time. Then lead made the call to check in on the primary frequency, and I replied, "Stand by." I remember wanting to tell lead that I was hypoxic, but because of my confusion, I couldn't figure out how to make the call.

I transitioned to brain-stem power and executed the immediate action steps for Hypoxia/Low Mask Flow/No Mask Flow. I selected emergency oxygen and secured my OBOGS. I started a gentle descent, and for the first time since the ECS surging began, scanned my cabin altitude. It read 10,000 feet, which is within limits for 30,000 feet.

I told lead that I felt hypoxic. He suspected something was wrong, and although I did not realize it at the time, he had begun to join on me. He told me to select emergency oxygen. I said that I had done this step and had secured the OBOGS. He directed me to increase my rate of descent, and continue to below 10,000 feet cabin altitude. Because of poor weather below 21,000 feet, we decided to level off at 22,000 feet, where the cabin altitude read 8,000 feet. I secured the emergency oxygen and took off my mask. After about 10 minutes I began to feel normal. I was certain that I was no longer hypoxic, but overall felt about 80 percent.

We opened the pocket checklist (PCL) and reviewed the checklist for hypoxia while using the auxiliary radio. We discussed my condition and decided I would keep the navigation lead to avoid having to fly formation through the clouds while descending to marshal. We switched radio frequencies to talk to the squadron representative and get help from a third party back on the boat. I had the option to recover aboard the carrier or divert about 100 miles to NAF Atsugi. After some discussion, I insisted that I felt good enough to recover on the ship.

I began a slow descent to my holding altitude of

I remember wanting to tell lead that I was hypoxic, but because of my confusion, I couldn't figure out how to make the call.

8,000 feet and again pulled the emergency oxygen. I started heading to the wrong marshal radial, and with help from my flight lead, got pointed in the right direction. I also put down my arresting hook, which I had forgotten to do. Because of my obvious confusion, I thoroughly reviewed my approach checklist. I again removed my mask and reseated the emergency oxygen.

I used the squadron-representative frequency to speak directly to my skipper, and he queried me about my physical state. I told him that I felt fine but was a little tired. He made the decision for me to land on the ship. This would give me the help of the ship's controllers and the landing-signal officers (LSOs), plus I wouldn't have to climb back up to a high altitude for the divert.

IF I HAD DIVERTED TO ATSUGI, I would have only had my flight lead to assist me and would have missed a delicious slider at midrats. Besides, if I was all jacked up on the approach, I could be waved off and still have had sufficient fuel to divert.

I commenced the approach on time. As soon as I was established on the final bearing at 1,200 feet, I latched up the auto pilot and again pulled the green ring. To my dismay, I realized that I hadn't fully seated the handle when securing the emergency oxygen and the O2 was depleted.

I wasn't receiving ACLS or ILS, which meant that I had to really concentrate on the approach. I started descending early, but just inside three miles, I began to receive ILS and realized I was low. I corrected the low position while flying the approach with my mask off.

With the mask hanging by the bayonet fitting, I called, "Hornet, ball" at three-quarters of a mile. I remember a power call or two from paddles and then a nice settle into the one wire.

After taxi, shutdown and postflight paperwork — all done on muscle memory – I found myself standing in the ready room a little confused, feeling very tired and sluggish. The SDO mentioned that I needed to go to medical. "Where's medical?" I asked.

My flight lead escorted me to medical. The flight surgeon met me, assessed my state, and called the diving medical officer at Naval Base Yokosuka to relay my symptoms. With the possibility of decompression sickness, the ship's senior medical officer initiated a medevac.

With IV inserted and an oxygen mask on, I was put in a wheel chair and taken to the flight deck via the ordnance elevator. I must have been a sight to see, holding an IV in one hand and my O2 bottle in the other. Up on the flight deck and ready for the helicopter ride, someone threw a horse collar around my neck and put a cranial on my head; now I felt safe. I had a 20-minute helo flight, followed by an ambulance ride. After the diving medical officer examined me, I had to get in the recompression chamber right away. I spent five hours there and wasn't even allowed to sleep. I was diagnosed with Type II decompression sickness and hypoxia.

After thinking over and over again about this experience, I am convinced that my recent training in the reduced oxygen breathing device (ROBD) helped me recognize the symptoms of hypoxia and complete the appropriate emergency procedures. Great crew resource management (CRM), especially with my flight lead and squadron representative, was instrumental in helping me recover aboard the carrier. The doctors on the ship and at Yokosuka made an outstanding decision to medevac me, which allowed timely treatment for decompression sickness.

A big lesson learned was that I should have remained on emergency oxygen until the symptoms of hypoxia had gone away (per the PCL). I should have coordinated to have medical personnel meet me at the jet to immediately take me to medical. Finally, I should have put in a to-go order for that slider.

I was fortunate to have recovered the aircraft and to have avoided serious medical issues from decompression sickness. I also beat the rest of the air wing back to Atsugi by about two hours.

LT. HUNTSMAN FLIES WITH VFA-195.

Halfway Hypoxic

BY LT. TYLER WILSON

It was a special day on deployment: the halfway point of my nugget cruise. As a reward for making it this far, I was placed on the schedule for a close-air-support (CAS) mission over Afghanistan with my squadron XO as the WSO. The XO and I joked that they had made a mistake, because every time we fly together something happens that makes our flight more eventful. With this in mind, we headed to the mass brief in CVIC.

After two months on station, the brief had become standard and took only a short time to complete. Once we had reviewed the products provided by the ground liaison officer for our specific missions, the air wing split off to their respective ready rooms for section briefs.

I was the lead-in-training with a senior JO as my wingman. The XO, as the overall mission commander, briefed our section. He pointed out items in detail that we normally briefed as standard; he wanted to keep our heads in the game. He stressed basic airmanship around the boat and how to avoid highlighting ourselves after a long combat flight.

After our brief, we had about 30 minutes until walk time. I sent one more email to my wife, and made sure that I had enough snacks. I also rocked out to one more Zeppelin song before getting geared up. While reading the aircraft-discrepancy book (ADB) in maintenance con-

trol, we noted a few surging-ECS and some ECS-degrade gripes, all of which had been repaired and signed off.

Start-up was uneventful, the single exception being that as my WSO turned on his up-front-control display (UFCD), it overheated and faded out. The XO and I figured that at least we had gotten our hiccup out of the way early. The troubleshooters requisitioned a new UFCD, swapped it out and had us ready for the launch within minutes. After the Case I launch, we pressed up the boulevard and continued with the mission.

It was the clearest night I had seen in Afghanistan: not a cloud in the sky, no blowing dust, no haze, nothing but clear air. Four hours and two tankers later it was time to RTB. Just one last scary KC-135 night tanker and we would be headed home. We sent our wingman to the tanker first, while we remained back to assist our joint tactical air controller (JTAC) with any last second tasking before the joint tactical air(strike) request (JTAR) was completed. We met up with our wingman on the tanker just as he exited the basket. Perfectly timed, we only required about 7,000 pounds to make it home on time and still be above ladder.

After plugging, I relaxed knowing I'd be at mid-rats in no time. After getting a little more than half my fragged gas, I heard the infamous "deedle-deedle" of the master-caution tone. My WSO reported we had an on-board oxygen generating system (OBOGS) degrade caution. I wasn't concerned because I had seen this caution on more flights than I could remember. You'd normally get the caution because a pilot or WSO took off their mask and forget to turn off the oxygen-flow knob. My focus remained on the iron maiden. I only needed about 500 more pounds of fuel to make it home.

A few seconds had passed by when the XO asked if I had my mask on. I responded that I did and asked if his was on. He assured me that it was. Realizing both of us had our masks on, we then disregarded the easy solution and tried to troubleshoot what we thought was a random caution. Both of us had good flow in our mask, cabin pressure was holding steady at 8,000 feet, and we felt "just fine." We informed our wingman, who said that if either one of us started to feel funny to speak up. As soon as he unkeyed his mic my face felt flushed. I began to tingle, and my WSO was hit with a wave of sudden sleepiness, just like the reduced-oxygen-breathing-device (ROBD) simulation we used during workups.

When he asked if I had turned off my oxygen-flow knob, I incoherently mumbled something.

We quickly realized this was not a random caution but a bona fide, full blown, no kidding, OBOGS malfunction. I immediately dropped down and away from the tanker and pulled my emergency oxygen green ring. My wingman called for the tanker to do an emergency breakaway.

A full minute and a half had gone by before we completed our OBOGS caution emergency-action items:

1. EMERGENCY OXYGEN GREEN RING(S) - PULL.

2. OXY FLOW KNOB(S) - OFF.

3. INITIATE RAPID DESCENT TO BELOW 10,000 FEET CABIN ALTITUDE.

We learn the importance of knowing and executing bold face cold from the beginning of flight training, but when you try to do these steps in less than optimal conditions, it can be easier said than done. I pulled the green ring with no problem, but getting the oxygen flow knob off was harder than I expected. I thought I had turned it off, but in reality, I had just flicked the knob without moving it. After a few seconds, my WSO had come out of it and felt normal again. I, however, was still a little less than optimum and couldn't figure out why.

My WSO repeated the bold face to make sure we were on the same page. When he asked if I had turned off my oxygen-flow knob, I incoherently mumbled something. He then directed me to make sure it was off. I physically turned to look at it and realized that I had not turned the knob completely off. I then turned it off and started to get good flow of 100-percent oxygen from my emergency-oxygen bottle.

The curtain of hypoxia started to lift. I soon felt well enough to return to the ship. My wingman thought returning to the ship was not a good idea, and we all agreed to start moving the section toward Kandahar. I was a little ashamed, but I agreed that was the smart decision.

I gave him the admin lead for the purposes of airspace coordination, while I retained the physical flight-lead position to get myself on deck. As we flew toward the field, my WSO and I were still looking at the PCL. We wanted to make sure we had completed all the required checklist items and had read all notes, warnings and cautions.

Our wingman relayed the information Kandahar approach gave to the section. Information regularly briefed was that Kandahar approach had two frequencies. We never did confirm what frequency we were working, which resulted in a breakdown of CRM between my wingman and I. It turned out we were on separate frequencies. As we answered approach calls, we thought our wingman was too quiet and was probably troubleshooting with the PCL or looking at approach plates.

I never told him that I felt better, and he was treating me as if I was still hypoxic.

Finally, about 20 miles from the airfield, we got on the same page. He did exactly what a good wingman should do: Recognize your lead is not in a normal state of mind, step up and make the right call. He made sure we did our ship-to-shore checklist, reminded us to take extra care with the carrier pressurized tires, and briefed us about landing at a field in a combat zone. As we lined up for the straight-in, the only thought in my mind was that I hadn't landed on a runway in four months. I hoped I wouldn't blow the tires.

I TOUCHED DOWN TO THE SWEETEST, smoothest, Air Force-style landing of my life. It was beautiful. All I had to do was stop the jet. The anti-skid hadn't been turned on for quite a while because we had been landing only on the carrier. Also, the brakes were probably covered in grease. As we rolled down the runway, I gently applied the brakes, my WSO read out the board speed, "96 at the 9 board, 85 at the 8 board, 78 at the 7 board," and so on.

I was a little fast, but the jet was decelerating and tracking straight. We used every inch of the runway and turned off at the end. We completed a slow taxi in the dark to an unfamiliar VMFA-122 ramp.

Once in our parking space, the MAKER's had troubleshooters greet us. They quickly diagnosed that our OBOGS concentrator had failed; no amount of airborne troubleshooting would have made a difference. A major lesson relearned: Bold face is bold face. It doesn't matter how many times you have seen something or think it doesn't apply, you will never be wrong for executing bold face emergency-action items.

Since my first flight in the Rhino, I've been told this jet is smarter than I am: If it's telling you something, it's for a reason. If we had waited around a little longer breathing bad air, we could have exacerbated our hypoxic condition and possibly lost control of ourselves and the aircraft. In the end, our half-way, combat-cruise sortie resulted in a hypoxic episode that could have been avoided. Always execute your bold face immediately and methodically – you can ask questions later.

LT. WILSON FLIES WITH VFA-22

As much as I've enjoyed reading Approach *stories over the last few years, my goal was to never write for this publication. My hope in drafting this article is that other aviators might learn a lesson from me and handle their time in the crucible differently.*

Where's the Green Ring?

BY LT. ZACHARY MATTHEWS

This tale began in late March with a good deal cross-country with the XO and Ops O. Our Hornet light division took off from Gainesville and headed north. We spent the first half of the flight to Indianapolis dodging weather. As we crossed over Atlanta, we approached another cloud bank, and I began to move closer to my lead. I look inside my cockpit and briefly saw the two L/R BLEED warning lights illuminate. I heard Betty say, "Bleed air left, bleed air left." As quickly as they appeared, the red warning lights went out and the cockpit became much quieter. Then I saw three cautions on my left DDI: L BLEED OFF, R BLEED OFF and OBOGS DEGD.

I've only had several emergency-procedure (EP) sims. In my limited experience handling EPs in the simulator, the warnings came on and stayed on. I knew when a bleed-air leak occurred the bleed-air-leak-detection (BALD) system should shut it down, however; I didn't know the warning lights would go out so suddenly once the leak was isolated. My OBOGS still appeared to be working despite the glaring caution that indicated otherwise.

I then reported to my lead, "I've got a problem here."

I told him that I had momentary bleed-air warning lights, but they had gone out. He then asked if I had inadvertently hit the fire test switch. "Well, maybe I did," I thought. Everything seemed normal, except for the cautions remaining on my DDI. It was entirely possible that I accidentally had hit the fire test switch, which would trigger the red warning lights and the aural tones, as well as shut off the bleed-air system. However, after the incident, I remembered that all the lights illuminate with the fire test switch and that Betty always starts with, "Engine fire left."

As I pondered the situation, like a deer staring in the headlights of a semi on I-95, I exhaled and suddenly couldn't breathe. When the OBOGS shut down with the rest of the ECS, residual air remained in the system. This air had just run out, and I had a perfectly sealed

I could feel my mind slipping away from me, all while trying to fly form in the clouds.

rubber mask on my face which prevented me from inhaling. The cabin pressure dumped as well, sending the contents of my sinuses down the back of my throat. My instinctual, and incorrect, response was to pop off my mask. While this was happening, I told lead exactly what I saw. He quickly and correctly surmised that I was dealing with an actual emergency.

He instructed me to "Pull the green ring."

I thought, "OK, the green ring, left side. Where's the green ring?"

I could not find the green ring. I've strapped into a Hornet more than a hundred times (a lot, I know) and looked at that green ring every time. My problem was that I'd never actually put my hand on it in flight. I'm 6 feet 4 inches tall and my flight gear restricts my vision down into the cockpit. I couldn't see the green ring, so I couldn't pull it.

The effects of hypoxia were immediate and overwhelming. I was acutely aware that my mental faculties were quickly fading. I couldn't find the green ring where I expected it to be, and in my state of confusion, I somehow regressed back to my FRS days where some of the older jets have the green ring on the inside of the ejection seat. I was literally lifting up the seat cushion looking for it. I was panicking. I could feel my mind slipping away from me, all while trying to fly form in the clouds. I had enough useful consciousness to know that if I didn't find the ring within the next five seconds I would need to do something else.

THE DEFINITION OF STUPIDITY, or hypoxia, is to do the same thing over and over while expecting a different result. I was a prime example. I couldn't find the ring, so it was time to descend. I didn't discuss this decision with anyone. I made a unilateral decision as my lead and XO were trying to talk my eyes onto the green ring.

I heard, "Left thigh, left thigh!"

I then looked out to my left and saw the most beautiful, glorious thing I've ever seen: A big fat hole in the clouds to the west, complete with sunshine and blue skies. It was wonderful. "I'm going there," I thought.

"I'm descending," I said. I pushed the stick forward. My lead and the XO quickly become smaller.

As I began my descent, a radio call from lead cut through the hypoxia and rattled me into doing something useful.

I heard, "Left thigh, by the harness lock!"

I have used the harness lock before in flight; I knew where that was. I put my hand on it and went back an inch and, there it was: the green ring. I pulled it and felt the wonderful flow of oxygen. I put on my mask and the hypoxia symptoms immediately cleared. So, I had that going for me, which was nice.

"Is your mask on?" asked Dash 3.

"Yes, XO," I replied.

Everything was going to be OK, but the flight wasn't over, yet. I was in marginal VMC on top with the XO now on my wing, but my lead had continued on course. Remember, we were over Atlanta, one of the busiest aviation corridors in the country, and I had just rapidly descended 10,000 feet directly over the city. Our Atlanta Center controller apparently was a fan of the Navy and also happened to be Johnny on the spot with a suitable divert: Dobbins ARB. He immediately helped the emergency section (the XO and me) with a separate squawk and vectors to Dobbins. The XO and I read through the rest of the EP out of the PCL as we set up for our PAR.

The rest of the approach went well, and I touched down to a nice reception of fire trucks and ambulances. Say what you want about the Air Force, but the folks at Dobbins were wonderful hosts. Everyone from tower to the linemen were professional, and they did everything they could to help us out.

My squadron sent a maintenance detachment on Monday to fix the jet, so I could fly it back to Oceana. I found out that a $7.38 rubber boot connecting the ECS turbine to the bleed-air ducts exploded in the keel. The AME1 in charge of the maintenance detachment said he'd never seen one do that in more than 10 years of working on Hornets.

What can you learn from my mistakes? The first step in the dual bleed-air-warning procedure is not to talk. The PCL states that you shall execute the boldface for warning lights "of any duration." Also, because the BALD system should immediately shut down the bleed-air system when it determines a leak, you may not see a warning light. The indications of a dual-bleed-air warning may only be Betty, or just the associated BLEED OFF cautions and OBOGS DEGD.

This emergency really becomes three separate emergencies: dual bleed-off cautions, loss of cabin pressurization and low mask flow/no mask flow/hypoxia. The good news is that a common step that solves 95 percent of your problems: Emergency oxygen green ring – PULL.

Imagine if I immediately had pulled the green ring, as NATOPS instructs. "Lead, I had dual bleed-air warning lights. I've pulled the green ring, recommend descent to 10,000 feet." Done. Easy. Problem solved. Just land the airplane. Instead I became hypoxic, almost lost a jet and my life.

Few emergency procedures in the Hornet need to be done right now. Pulling the green ring is one of them. We all know that we're supposed to, "aviate, navigate, communicate, but you can't aviate if your brain is starved of oxygen. I communicated first. Big mistake.

You may see the green ring every time you get in the jet, but I strongly suggest that the next time you strap in, put your hand on it so you know where it is. Pull it if you want to. The great thing about the green ring is that you can reset it; it's not a one-way street. The Navy has plenty of gaseous oxygen to replace whatever you suck out of the seat pan; it really isn't a big deal to pull it if you don't need it. However, it is a big deal if you don't pull it when you should. That little ring is as important as the ejection handle. It's just as likely to save your life.

LT. MATTHEWS FLIES WITH VFA-37.

Mishap-Free Milestones

HSL-42	189,087 Hours	25 Years
VFA-131	100,000 Hours	23 Years
VP-40	250,000 Hours	47 Years

Dysfunctional Air Stairs

BY LT. TODD JEPPERSON

"Crunch!" This is a sound you don't want to hear upon landing, especially in a foreign country. We had been on the deck for less than 15 minutes in Germany, when our short visit got forcibly extended. The plan was to pick up a communications team and head to Great Britain for an exercise. The trip would be long, but we'd still have time to see the sights in England.

Our spirits were high as our crew set out from Tinker Air Force Base on our way to Germany. After landing our E-6B in Germany, the simple procedure of pulling up airstairs to the jet changed our plans. The stairs were driven by an airport employee, who we assumed would be operating fully functional equipment.

When the stairs neared position, the crew members on the ground and on the jet called, "Stop."

Then we said it louder, then louder, until we were screaming "Stop!" at the top of our lungs.

Crunch.

Upon initial contact with the jet, one would expect the stairs to stop raising. That expectation was not met. Instead, the stairs continued to raise almost a foot and a half too high.

It would be bad enough if the story ended there, but sadly it does not. The driver finally got the stairs stopped. We inspected the initial damage. It was time to try to lower the stairs. Not once, but twice while "lowering" the stairs, they proceeded to go farther up. As a steady stream of airport officials, U.S. base officials, insurance adjusters, German police, and U.S. Customs officials cycled through the circus that had grown during our postflight, it was clear that our short stopover to Germany had been extended.

This crunch would be no simple fix. That door had been on the airplane since Boeing rolled it off the assembly line. Teams from Tinker Air Force Base and Jacksonville were flown out with parts and specialized tools. The German airline Lufthansa graciously provided the use of their machine shop. A total of 257 man-hours and $335,000 were required to fix what had been done over the span of five minutes.

What did I gain from this experience, other than an irrational fear of stair trucks? One can never be too careful. It's easy to assume that the airport equipment will work correctly. Other planes have taxied through here, so we must fit. Or he is taking off, so the weather must be fine. The list goes on and on.

In aviation, we do risky things, so we use ORM to assess and mitigate it. The ORM process does not conclude with landing. We use it in every aspect of our lives, in the sky, on the flight line, and under the airstairs.

LT. JEPPERSON FLIES WITH VQ-4.

Please send your ORM questions, comments or recommendations to:

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Without a Paddle

BY LT. ROBERT ANDREA

None of us believed something would go wrong that beautiful and clear August day. Before we get into the real meat and potatoes of the story, let me give you a brief history.

Our command – VXS-1 – had a small, eight person detachment with one RC-12F aircraft at Eielson Air Force Base, Alaska. The det was scheduled for two months.

VXS-1 is stationed at NAS Patuxent River, Md. We primarily operate the NP-3D, but we also employ two RC-12 aircraft, an MZ-3A airship and Scan Eagle UAS. The squadron exists solely for airborne scientific-research projects under the auspices of the Naval Research Lab in Washington, D.C. Primarily a military-operated outfit, VXS-1 caters to scientists, technicians and other project specialists.

In June, we began flying support missions based in Alaska for the National Oceanographic and Atmospheric Administration (NOAA) and the National Geodetic Survey (NGS), on a project aimed at recording terrain elevations by measuring fluctuations in the Earth's gravity. It involved very sensitive and expensive equipment, though my primary requirement as the pilot was for the scientist to just show me where to point the aircraft's nose.

The two-month detachment would involve three civilian project specialists, two of which would operate the test equipment in flight, while the other would remain at Eielson operating the ground-communication devices. We also had four pilots (for crew rotations) and one contract-maintenance technician. Each mission required two long legs of a few hundred miles each on cardinal headings. Any longer, with such a payload, and the C-12 just wouldn't have enough gas. We were supposed to fly as straight and level as possible for the gravimeter to get an accurate reading. The project specialists did their inflight research in the aircraft's cabin.

The majority of the detachment went without a hitch. The aircraft operated like clockwork through 120 hours of flight time, and we were scheduled to come home on time. Naturally, when we only had a handful of missions left in the detachment, a couple maintenance gripes showed up. Our standby attitude indicator, which is a backup gauge on the pilot's console operated by vacuum air, wasn't working. We ordered a replacement part but it arrived in bad condition, possibly damaged during shipping. After evaluating the situation from a risk-management perspective, the Det OinC and the commanding officer determined the aircraft was safe to fly, but only during VMC missions. They referred to the C-12 NATOPS, which states the standby attitude indicator is only required during flight in IMC or at night. We were subsequently instructed not to reposition to home plate until the new part had arrived and was installed. We flew three missions with the aircraft in this condition, including about eight hours (with a lunch break) on the day before the mishap flight — all without incident.

A second, more complicated gripe was found during troubleshooting of the standby attitude indicator. Anyone who's ever flown a small single or twin-engine aircraft is used to doing engine run-ups before takeoff, because you're not blessed with altitude or airspeed if engine problems develop shortly after rotation. The C-12 NATOPS states, however, that completion of engine run-up checks before flight are required only if maintenance has been performed on any of the systems affected by the engine run-up checklist, otherwise completion is at the discretion of the aircraft commander.

We had not been conducting engine run-ups prior to takeoff for as long as I had been in the squadron, even though we train to it during initial instruction at flight safety. No one knew the real reason(s) behind this practice, and honestly, no one bothered to ask why.

During this set of run-ups, we discovered the aircraft's rudder-boost system was malfunctioning. The rudder-boost system is designed so that in the event of an engine failure, a pressure sensor in the tail section would recognize a greater than 60-psi differential between the engine bleed-air systems. The system would allocate air from the good engine through a regulator and kick the rudder to aid in directional stability. During engine failure, rudder force required to sustain balanced flight in the C-12 can exceed 150 pounds in some cases. This situation is exacerbated by the unique design of our squadron's aircraft, which has a belly radome and a bulbous rudder.

Troubleshooting revealed that the rudder-boost system was not responding to inputs from the left engine, and inputs from the right engine caused the system to kick the rudder considerably earlier than required. With very limited troubleshooting resources on site, the contractor determined it was most likely a bad electrical solenoid in the tail section.

We could've waited another week or so for the part to arrive, but again, in the interest of accomplishing the remainder of the missions and getting home on time and on budget, we received approval to fly with the rudder-boost system turned off. We also did not complete the full run-up checklist that day, because a malfunction occurred during the overspeed governor/rudder boost check. We stopped after conducting the primary governor checks and put the plane to bed. In retrospect, it probably would've been a better decision to complete the checklist.

On our final mission, we began the morning with a crew picture in front of the starboard engine. We did a normal preflight. The weather-guessers said that it was going to be a beautiful day, with only a few low-level clouds, but nothing to worry about for our mission. We filed IFR for block altitude 12,000 to 14,000 feet, and were tasked with two east-west legs extending over central Alaska.

Takeoff and transition to cruise was no problem, and we arrived on station about an hour into the flight. While transiting, we noticed the weather-guessers had only been half right: A cloud deck was developing beneath us at about 10,000 feet, and even though it couldn't have been more than a few hundred feet thick, it was slowly building.

I was in the copilot seat. About two hours into the flight, while heading outbound, I noticed a very unusual crackle in my headset. I asked the pilot if he had heard the same thing, but he replied, "No."

At that moment the right generator light (R DC GEN) and MASTER CAUTION lights illuminated. The generator load meters indicated the right generator output had dropped to zero, and the left had assumed the system load. We pulled out NATOPS and did the generator-reset procedures, but that didn't work. We turned back toward the airfield. We had about 190 miles to Eielson AFB, and neither one of us really thought this was more than a minor glitch that could be quickly corrected.

After a few seconds, I glanced outside at the right engine cowling and saw the biggest fluid leak I had ever seen. I couldn't tell if it was fuel or oil, but NATOPS states the engine should be shut down if there is any visible leak. I immediately notified the pilot in the left seat, put my hand on the right condition lever, and called for concurrence on the shutdown of the right engine. Before he could respond, the accessory section burst into flames and began to eject small pieces of debris out of the louvers on the top of the cowling.

My eyes were wide open as I called, "Fire! We have flames. Right condition lever to fuel cutoff, concur."

As I said that, the MASTER WARNING and R ENG FIRE lights came on. We executed the first four steps of the emergency-shutdown checklist from memory and extinguished the fire, but now our situation had become very complicated.

We started a descent to 12,500 feet. We then smelled smoke in the cockpit, and while pushing up the power on the left engine to maintain speed the L BL AIR FAIL light illuminated (a red warning light indicating a malfunction on the left engine that could be anything from a bleed-air leak to another engine problem). We had a lot of items to prioritize. Because the engine fire was under control, we decided to handle the bleed-air malfunction first. Closing the bleed-air valves would most likely correct the smoke in the cockpit as well. However, closing the valves cuts off air to the cabin, so we prepared the plane for complete depressurization. We notified our project specialist of the transpiring events and got our oxygen masks ready. As the cabin altitude climbed, the smell of smoke in the cockpit ceased.

WE WERE SINGLE ENGINE, single generator, depressurized, over a small cloud deck, with a bad standby attitude

The outboard side of the right engine accessory compartment. Note the charring and congealed oil residue.

indicator (restricted to VMC only), and crossfeeding fuel over the middle of Alaska with the only airfield that isn't a gravel strip located an hour away. We verified with our GPS database that every nearby airstrip was gravel, probably poorly maintained, and meant mostly for bush-pilots. If we were to try to land on such a field, we'd most likely do heavy damage to the airplane, not to mention the aircraft would be stuck there for a long time.

We were also unsure whether something sinister was going on inside the left engine, so we discussed high altitude, power-loss procedures. We verified the minimum safe altitude was 4,600 feet, and the bases of the clouds were well above that. Even though we would have to violate NATOPS by penetrating a cloud deck, we might have enough time after popping out of the clouds to make a gear-up landing. We would also secure all unnecessary electronic equipment to allow for battery power to the attitude indicators. We probably were not as equipped for a survival situation as we would have preferred. We had a liferaft and survival kit in the back of the plane, but nothing sufficient to survive more than a few days in the Alaskan wilderness. We didn't bring survival vests on the det or have any food or water onboard. We didn't carry firearms for protection from wildlife (formerly a state requirement for flying over Alaska). We did get back into radar coverage (some parts in central Alaska are not covered by radar), so at least search and rescue would be quickly notified.

Eielson AFB was our best bet, so we decided to accept the risk and continue flight for that final hour, remaining on oxygen for the duration of the transit. That hour was the longest one I've ever experienced. The left engine lasted long enough for us to make a single-engine landing. The weather had cleared by the time we arrived.

The safety and engineering investigation revealed the forward bearing on the generator had failed, causing the shaft to wobble in its casing, which ended up disrupting oil lubrication and creating the leak. The fire was most likely oil fed, a result of generator arcing combined with the melting of the tubing and insulation in the accessory section. Could we, as pilots, have prevented this malfunction from occurring? No. Had the circumstances been different with regard to our mission planning, the chances of this malfunction happening closer to a suitable airfield or even on the deck could have been higher. We'll never know.

The extensive damage to the right engine and accessory section required complete replacement, and the plane was down for nearly five months. VXS-1 also sponsored a NATOPS change which corrected some errors in the generator-reset procedure through knowledge gained from this mishap.

THE MORALS OF THE STORY? I CAN THINK OF FIVE:

1. Always perform a deliberate ORM before any detachment. Take into account the hazards associated with your operational environment, especially in the case of a survival situation.

2. Check for requirements not native to Navy operations when flying in unfamiliar territory. If all other pilots are required to abide by certain rules, wouldn't it make sense that we at least try to abide by them as well?

3. Don't forget that aviation is inherently dangerous. Yes, it can happen to you, even when you think, "These are the most reliable engines on the planet."

4. If you make a mistake, admit it, document it and learn from it.

5. Never take a crew picture in front of the plane before the detachment is complete.

LT. ANDREA FLIES WITH VXS-1.

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

Good Pilots, Rough Nights

BY LT. GRANT MORRIS

Three-quarters of the way through my first time at sea—a quick 40-day cruise packed with training flights in pursuit of tactical qualifications—one flight stood out over the rest. I experienced for the first time something worthy of a CRM case-study.

As a mere pilot qualified in model, I was confronted with knowing little more than the standard that I had been trained to and what I had learned underway. This left me to draw on the basics of crew resource management (CRM) when my helicopter aircraft commander (HAC), an experienced member of the squadron, was having a rough flight.

Eventually, after we were aboard the ship, I realized that human factors often comprise many of the holes in the Swiss-cheese model, and that the best tools to overcome them are given to us from the beginning of flight school.

The first time I was introduced to the deliberate ORM and CRM processes was in an aviation-preflight-indoctrination (API) classroom. I sat through a painful Powerpoint slide show that I would have readily forgotten, if it weren't for what every helicopter pilot learns and briefs throughout the first several fam flights in the HTs. I remember the drastic difference in mindset shifting to a multi-piloted platform from the single-seat mentality of T-34s. The same concept was developed further in the fleet replacement squadron (FRS). Instructors were more deliberate in reinforcing a crew concept, as the likelihood they would see us again in the fleet increased. At some point, I believe everyone has a realization that if the worst were to happen to a multi-crewed aircraft, everyone inside pays the price.

Because of the limited number of helicopter aircraft commanders (HACs) on a detachment, our schedule often requires pilots to fly multiple events in one day. When the schedule was posted the night before, I asked my HAC if he wanted us to brief early with his first crew or later in the aircraft after he returned. He told me and the aircrewman to get a sufficient amount of rest, crunch

CRM Contacts:

Naval Aviation Schools Command
Crew Resource Management
181 Chambers Ave., Suite C
Pensacola FL 32508-5221
(850) 452-2088/5567 (DSN 922)
Fax (850)452-2639
https://www.netc.navy.mil/nascweb/crm/crm.htm

Lt. Tony Anglero, Naval Safety Center
(757) 444-3520, Ext.7231 (DSN 564)
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We were only an hour into the three-hour flight, when I noticed something wasn't quite right.

the performance calculations, brief with the anti-submarine/surface tactical-air controller (ASTAC), and meet him in the helicopter with an ORM worksheet in hand. Thinking I was doing him a favor, I went by the vending machines and got him a soda just before flight. It seemed like that covered all the bases. We executed his plan with the addition of a full NATOPS brief while waiting to launch. Everything was standard with the exception of the HAC noting his minimum crew rest as he adjusted to an earlier flight schedule, as well as being on the second half of a double bag. Looking forward to the caffeine, he quickly drank the beverage, and we got airborne.

We were only an hour into the three-hour flight, when I noticed something wasn't quite right. My HAC was not talking as much as he usually does, and quite honestly, he was letting me do more of the flying than usual. I glanced over to see him rubbing his eyes. He looked far more fatigued than I had seen him in the previous weeks, and he was little pale. Trying to appraise the situation, I asked how he was feeling. He said he was tired and not feeling well—his stomach was bothering him.

I promptly got the aircraft in a straight-and-level flight, and we prepared for the likelihood he might vomit. The plastic bag we usually keep over the NATOPS was drafted into service and kept at the ready. A discussion of any history of flight sickness ensued, and with a few laughs and stories, the crewman and I talked him off the ledge. For the record, he never threw up.

WHILE HE RECOVERED from the immediate effects of what we later concluded was the soft-drink hitting him, he never made it past being exhausted from the long flight and the lack of rest. It was soon twilight, and we were scheduled for multiple approaches to the boat for the sake of the HAC's night currency. We discussed whether getting the quals was worth doing. We concluded that with the rigidity of our parent ship's schedule, there was no time like the present to complete the deck-landing-qualification (DLQ) session. In short, the climate on our ship was not entirely LAMPS friendly, and that led us to proceed with the opportunity we had instead of letting things slide right for the sake of being cautious.

The ship had set flight quarters, and we soon were on approach to the back of the ship. I could tell immediately that the HAC was going to need me to increase my participation when I saw him low on the approach. I challenged him, noting his altitude, and he made the corrections I recommended. Over the back of the boat I could also tell he was "chasing it" a little, but with the help of the crewman in the back, he was conned into position and landed.

Evaluating the approach and landing while on deck, I didn't feel the need to call it quits. However, maintaining normal parameters was consistently challenging on the next three approaches; if it wasn't altitude, it was closure. I made several altitude and airspeed calls to talk him back onto profile during each one. He would always respond with prompt and correct inputs to my challenges. No matter how many times I chimed in to comment on his approach, he never lost his cool or cut me out of the equation. He was always smooth and safe—albeit not in his usual form—over the back of the boat prior to landing. I kept my hands free to back him up on the controls, if the need were to arise.

Once the helicopter was chocked and chained, we passed the aircraft off to the next crew and debriefed the flight. After walking through the entire flight and how it unfolded, my HAC told me to remember two things. First, no matter how many hours you have in the helicopter or how many night approaches you have logged, you are not above having a rough night at the back of the boat. Second, he said to always remember that despite not being at the controls, the other members of the crew are every bit as capable and responsible for making the aircraft a safe place to be. Intensive CRM between the members of that crew undoubtedly kept us safe to make it home that night.

I would like to say we did everything correctly, but I think we missed something in our ORM process: Pressure to complete mission was perceived to be higher than it truly was, especially with how the events unfolded. At least, that was how I justified proceeding even though it would have been far safer to knock-it-off after we were on deck the first time. With everyone aboard at the end of the night, I think the crew did its best to strike the balance between the risks associated with what we do and the apparent necessity to do it.

Despite the physiological issues, the human factor most likely to get us in trouble that night was our desire to accomplish the mission above all else.

LT. MORRIS FLIES WITH HSL-41.

Instructor or Evaluator– **What Are You?**

BY LCDR. PATRICK SMITH

I've been in the Navy twelve and a half years, and I feel like I just graduated yesterday from VT-35 in Corpus Christi. Naval aviation continues to be an amazingly rewarding career, and I wouldn't give it up for anything. Now that I have a bit more "salt" on my cover than when I wore ensign bars, I want to discuss an issue that never gets talked about in squadrons or at social events. It's the taboo discussion about what it means to be an "instructor." Are you really instructing people or are you just an "evaluator?" I write this article to provoke some thought and introspection from pilots all over the Navy.

In flight school I had the pleasure of flying with a broad spectrum of personalities, all of whom had a different expectation of how a student should perform. I also realize the syllabus has changed dramatically in flight training.

It's my belief that 85 percent of the flights I had in the training command were evaluations. I simply was being compared to the previous day's student or the average flight-school student. Was I being instructed? It is tough to say. I was too worried about failing or messing up a maneuver that a contemporary had done with grace. I wasn't sure if I had walked away from the flight with better skills.

I obtained my wings of gold and was sent to the fleet to fly EP-3s. There I learned the dynamics of a multi-crew, multi-engine platform. I flew with P-3 instructor pilots for another syllabus of upgrade events. I encountered a similar feeling that I had in the training command. Some flights went well, others could have been better. Some flights I would learn great things, on others I was so worried about messing up that I didn't learn a thing. It was all a function of with whom I was flying and the posture they had taken toward instructing junior pilots. How I felt about my flight was directly related to whether I was flying with an instructor or an evaluator.

Several lessons can be learned from the feelings that I have had while upgrading in different stages of my career. I think an instructor should be exactly that, someone who instructs a junior pilot to be successful, by imparting the wisdom gleaned from several years of flying experience. Every hop is part evaluation, part instruction. But at the end of the day, it is incumbent on senior pilots to develop their replacements, not just chastise them for their mistakes. The tone of a flight is set by the person that decides the fate of the upgrading pilot. You make the decision on how your student will perform based on your demeanor. I'd be willing to guess the flight will go much better by approaching it as an instructor versus an evaluator.

Once you have learned to fly more than two or three multi-engine aircraft, the upgrade game doesn't change—only the faces do. I continue to see these same types of instructors. Now that I'm on the other side, I think back to my experiences every time I instruct someone. While standards must be upheld for our fighting force to remain successful and viable, we must look for opportunities to learn and differentiate them from the times to evaluate.

LCDR. PATRICK SMITH IS A PILOT WITH VR-55.

MISHAP S

URVIVORS

BY LT. ED POYNTON

As the mission commander on a flight that resulted in a Class A mishap, I had the distinction of being the first aircrew to bailout of an E-2C in 20 years. I was also the first to use the new PSE parachute equipment in an actual survival situation. For the three members of the flight who survived, a solid knowledge of the aircraft systems, a strong familiarity with NATOPS procedures and a healthy dose of adrenaline allowed us to successfully egress the aircraft.

Aircraft 601 had been returning to the carrier on station in the North Arabian Sea. The weather at mom was VFR, the 1400 Case 1 (early) launch had begun, and 601, with a crew of four, was the only aircraft scheduled to recover.

Thirty miles north of mom, the copilot saw a right engine, oil-low caution light. The crew reviewed the associated emergency procedures (EPs) and began to get ready for what might become a "land as soon as possible" recovery. About 12 miles north of mom, with the right engine oil pressure deteriorating, we decided to secure the engine. Even though we executed the EP steps, the right propeller did not feather. After fighting for the control of the descending aircraft for more than a minute, and being unable to climb or maintain altitude, the aircraft commander decided to immediately bailout.

We already were prepared for a shipboard landing with our seats facing forward, harnesses locked, and our lap belts and drogue straps tight. I rotated my seat to call tower, announcing we were bailing out. Tower called back and asked for our position relative mom. The copilot answered, "Four o'clock, four miles."

I disconnected my ICS cord and released from the seat using my emergency-equipment release handle. Proceeding forward, I stopped behind the radar operator (RO), the most forward of the three NFO positions in the Hawkeye, as he double-checked his connections. While waiting, I realized the main entrance hatch (MEH) had not been jettisoned. I went past the RO toward the hatch. The RO saw me pass and immediately released from his seat to follow me.

Meanwhile, the pilot directed the copilot to jettison the door. However, while fully strapped and locked in, the copilot could not reach the door-jettison handle. The pilot gave the controls to the copilot, slid his seat backward, and pulled up the handle. The DOOR OPEN caution light illuminated, but the MEH did not separate from the airframe. When I reached the closed MEH, I pulled up the door handle. Despite the handle moving freely into the up position, the door did not open.

I tried to push the MEH into the airstream but couldn't push hard enough to overcome the slipstream around the plane. Without any other options, I lowered into a squat

and tried to push the MEH open with my leg. I had to fully extend my leg to get the door to crack even a few inches at the top. Once open at the top (still hinged at the bottom), I found and pulled the support-brace jettison cable. The MEH and support brace immediately separated from the aircraft. From my squat, I transitioned to a seated position in the opening, my feet dangling outside the aircraft.

Once I saw the copilot exit the cockpit, I realized that I actually was going to bailout. I moved forward to the edge of the MEH, still seated, put both hands on the parachute D-ring (ripcord handle) and forced myself from the aircraft.

THE RO MOVED FORWARD to follow me but slipped on condensation from the vapor cycle (cooling system for the plane's avionics). He was off balance and went head first through the MEH.

The copilot reached the MEH and looked forward to see the aircraft commander still at the controls. He was fighting to keep the aircraft stable for us to egress. Having seen me egress from a seated position, the copilot sat down and pushed himself out.

First out of the aircraft at an estimated 1,400 feet AGL, I pulled the ripcord and my parachute immediately deployed. However, the chute didn't fully inflate until the parachute's environmental bag worked free. The chute obviously wasn't completely deployed because I heard a loud "fluttering" sound. The bag separated (on its own) and the chute fully inflated.

The RO pulled his ripcord as he exited the aircraft head first. The chute deployed, and he swung underneath it as it inflated. He inspected the chute and noticed the environmental bag was still attached, but it worked clear without any action required. The copilot was last out of the aircraft at about 1,200 feet and immediately pulled his ripcord. His parachute deployed without incident.

While descending, I had time to inspect my canopy, inflate my low-profile floatation collar (LPFC), adjust my visor and prepare for a water landing. I didn't have time to release my life raft. When my feet hit the water, I undid my upper Koch fittings before the universal water-activated release system (UWARS) fired. Sufficiently afloat, I detached the two lower Koch fittings and held onto the crew backpack assembly, which floated next to me.

The RO had less time under his canopy but still got his LPFC inflated. The RO's UWARS activated when he entered the water. He waited momentarily to release from the backpack assembly and left one lower Koch fitting attached. Like me, the RO held onto the backpack assembly as it floated next to him.

The copilot did not inflate his LPFC while descending. When he landed in the water, he released his upper Koch fittings, swam a few feet to the surface and inflated the LPFC without any problems. He released the lower Koch fittings and held onto the backpack assembly before reattaching one of the lower Koch fittings to prevent the backpack assembly from floating away.

Once the initial shock wore off, I tried to talk with other airwing aircraft using my combat-survivor-evader-locator (CSEL) radio. Using the PTT function, I started calling on 243.0. After a few attempts, I realized that the sea state, combined with my LFPC floating high on my survival harness, made radio usage difficult. The LFPC was inflated but rising up, so I needed to use my arms to wrap around the LFPC lobes and "pull" myself up. Sea water kept filling the microphone cavity of the CSEL, and I had to continually shake or blow it out to transmit.

I opened the parachute backpack assembly and removed the sealed life-raft package, which is a shrink-wrapped cube with a thin string attached. When the raft is released during the parachute descent procedure, gravity will provide the shock to inflate the raft. Lacking that, the raft proved very difficult to inflate. However, once inflated the raft was easy to board. I sat up in the raft and again tried to establish radio comms.

The RO also wanted to inflate his raft and found both the survival-raft package and the survival-kit package in the backpack assembly. Neither package was labeled, nor was there any intuitive way to inflate the raft. Eventually the RO found the inflation cord and got it inflated. The RO boarded the raft, tied into his helicopter hoist ring and discarded his backpack assembly.

The copilot, like me, needed to pull his LFPC lobes down toward his body to keep his mouth and face out of the water. Once in the water, he tried to inflate his life raft by pulling the beaded handle on the parachute assembly. The raft package came out of the backpack assembly, did not inflate and began to float away. The copilot pulled the raft back, found two

attached lanyards, and pulled both until it inflated. Once inflated, the copilot boarded the life raft.

After a few minutes, I was able to hail an airwing helicopter. The SAR crew told me to ready my day-night flare to mark my position. When in range, the SAR crew told me to ignite the day-end (smoke) of the flare. The SAR crew spotted me, circled around my position and lowered a SAR swimmer. The swimmer performed a disentanglement and medical assessment before connecting the hoist to the helicopter hoist ring on my harness. Once inside the helicopter, we recovered the RO, who was floating relatively close, about 100 to 200 meters, to the copilot. However, because of the sea state, neither saw the other.

The RO, while floating in his survival raft, had seen one of the two SAR helicopters. By this time the plane-guard helicopter was joined by an alert SAR helicopter. The RO shot his pencil flare in the direction of the helicopter, but the helo crew never saw the flare. Meanwhile, the copilot found and unfolded his reflective blanket, and put the reflective side outward to attract attention. In hindsight, and in consultation with the helicopter SAR pilots, the orange side of the blanket would have presented more contrast than the reflective side, which looked like the sun reflection on the sea surface.

The RO was recovered by the same SAR swimmer who recovered me. The second helicopter recovered the copilot. Both helicopters, with survivors onboard, continued the SAR effort, looking for the aircraft commander. We later learned he had stayed at the controls until 601 hit the water, keeping the plane airborne long enough for us to egress, while knowingly surrendering his own ability to bailout. Despite a massive search from the air and sea, he was never recovered; he was declared "lost at sea" two days later, posthumously receiving the Distinguished Flying Cross for his heroism.

As mishap survivors, we were the beneficiaries of a squadron culture that promoted NATOPS training. Specifically, command-directed, scenario-based, crew-wide ditch and bailout drills were conducted at least twice a year. During these drills all aircrew participated in ready-room discussions of the ditching and bailout EPs, survival-gear demonstrations, and full-crew bailout drills. All four of us had participated in an extensive bailout drill only two months before the mishap. I am certain that this familiarity was key in allowing us to rapidly execute our NATOPS EP steps, under extreme conditions.

LT. POYNTON CURRENTLY FLIES WITH VAW-120.

Analyst comments: As one of the first aircrew to bailout of an E-2 in well over a decade, the author has provided critical lessons learned we all must take onboard. Ditch and Bail drills are crucial, and aviation water-survival training is not just another day at the pool. Although a bailout is extremely rare, we must be ready for it at all times and prepare for any contingencies it may bring with it. Bailing out is only half the battle — staying alive and knowing how to use your survival gear is just as important.—Lt. Brian Abbott, E-2/C-2/UAS/MFOQA Analyst, Naval Safety Center.

Time to Turn It Off

BY LT. ROB BEAUCHAMP


Transformer assembly (WRA-36).

Photo by AT2(AW) William Menzies

It seemed to be just another single-cycle, unit-level training flight in the North Arabian Gulf, which amounts to about an hour and a half airborne. I was the radar officer (RO) and also the junior NFO of the crew. I recently had completed a 2 v 4 air-intercept control (AIC) with three of our four Hornet squadrons. Our pilots included the squadron CO and a junior squadronmate. The rest of the crew in the back included a perspective combat-information-center officer (PCICO), who was working on her full CICO qualification and in charge of this training flight. We also had a level-five mission commander in the air-control-officer (ACO) seat, who was evaluating the PCICO and would take charge if necessary.

At the conclusion of the AIC event, the fighters pressed back toward the marshal stack. Less than five minutes after the fighter's departure, our radar reverted to the ON mode and stopped radiating. This situation indicated a possible failure of one of the two weapons replaceable assemblies (WRA). The ACO noted an odd smell immediately after we noticed the problem with the radar. The rest of the crew in the back concurred we had an abnormal smell. The pilots recently had turned on the heat, which could have caused an odor, but this smell was different. As the RO, I looked into the forward equipment compartment (FEC) at the radar boxes, and the other avionics and electronics equipment. I saw no signs of smoke or fumes — everything looked OK. I knew a revert to ON was not a serious worry for the radar, so I retimed out the radar with the concurrence of the PCICO. I wanted to get it operational again and make sure it would work for the next crew.

Once the radar timeout was complete, I tried to place the radar in OPERATE, but it immediately reverted to STANDBY and still did not radiate. This problem normally would indicate the temperature, pressure or cover interlocks of the radar boxes had not been met, which is another radar fault that is usually of no concern. A revert to STANDBY usually is a temporary pressurization issue and not enough to worry a crew. The possibility of the temperature interlock being the problem, combined with the previous unidentified odor, should have clued us into a more serious situation. However, the smell was no longer noticeable, and we had no visible smoke or fumes. Our crew decided not to turn off the radar, because that would require each NFO crewmember to spend 20 seconds resetting their scopes to regain display of IFF video.

We returned to the ship and flew a trap-cat-trap with no further issues. Little did we know how desensitized our noses had become to the fumes emanating from the transformer assembly, also called the WRA-36. When the aviation technicians (AT) entered the plane, they were overcome by the smell.

They removed the box and took it to maintenance control. Once opened, its smell quickly filled the area, including the ready room and much of the nearby passageways. It was an eye-opening experience for me to learn how quickly our senses acclimated to the fumes, to the point in which we could not identify an impending hazardous situation.

I learned that your nose will become desensitized to any strange odors quickly while you're confined in an aircraft. Had there been extremely toxic fumes that night, the flight crew could have become ill or died. The E-2C has an emergency procedure for fire, smoke and fumes that is most often executed for visible smoke and, on rare occasions, actual fire.

In hindsight, it would have been wise to execute this emergency procedure, which includes donning oxygen masks to protect the crew from what could have been noxious or toxic fumes. Also, a lack of visible smoke does not mean a lack of all fumes. We failed to fully investigate the source of the smell before reenergizing equipment.

Use your five senses; trust them to tell you when something in the plane is not quite right. Fully investigate any potential problem before doing something that could lead to a bad situation. Do not make our mistake and put power back on a box that is burning itself up.

LT. BEAUCHAMP FLIES WITH VAW-124.

BRAVO Zulu

VR-1

Left to right: AWFC Lanny Larimore, AWF2 Matthew Mier, LCdr. Christopher Muldoon, Maj. Todd Prescott, CS2 Jesus Collazo

WHILE FLYING A VR-1 LOGISTICS MISSION transporting a senior Navy leader and his staff, the C-20D (Gulfstream III) aircrew heard a hissing sound coming from the cabin door area as they descended through FL250. The cabin pressurization indicators confirmed a rapid increase in cabin altitude.

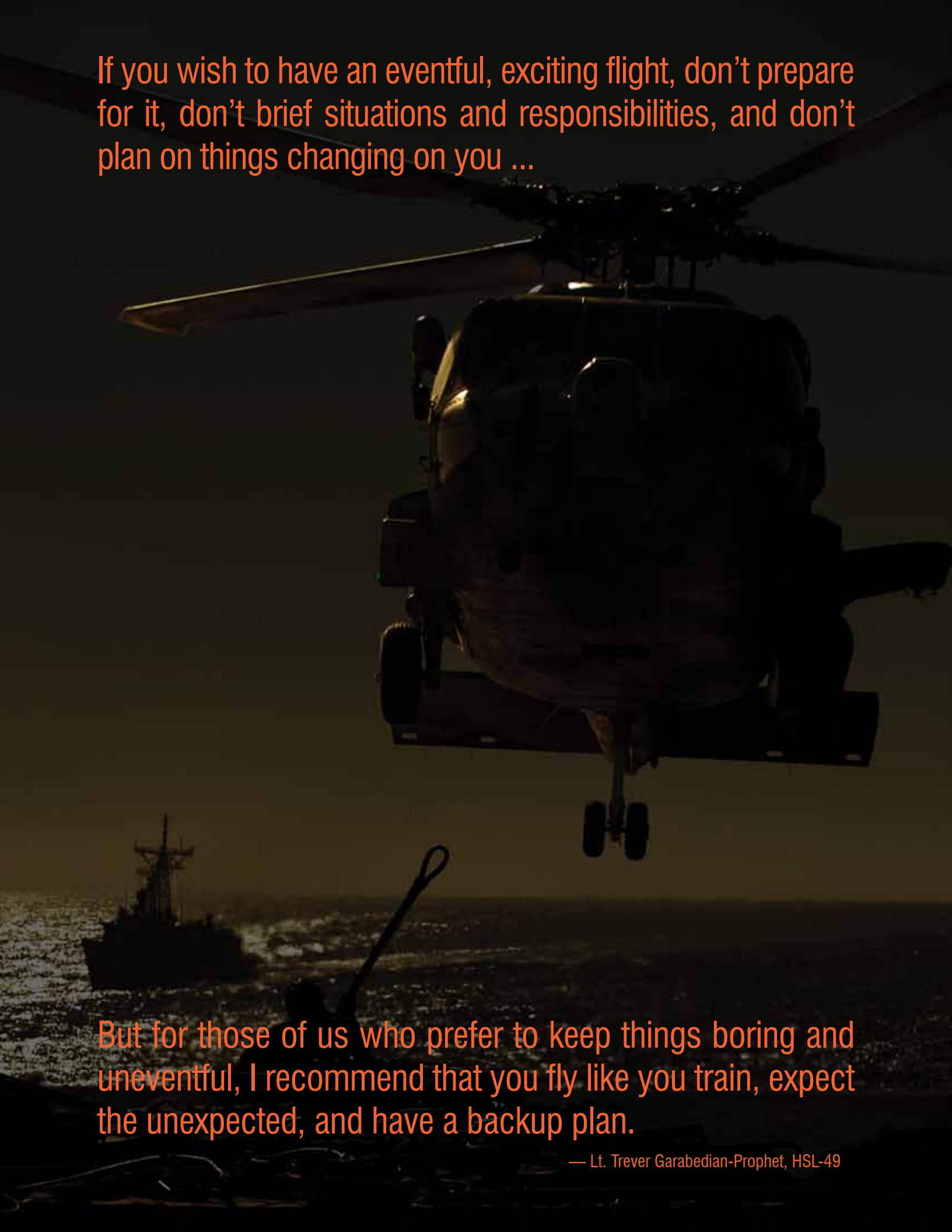
The aircraft commander, LCdr. Christopher Muldoon, donned his oxygen mask, took the aircraft controls and made an emergency descent. Major Todd Prescott, AWFC Lanny Larimore, AWF2 Matthew Mier and CS2 Jesus Collazo executed the emergency procedures for loss of pressurization. When level at 10,000 feet, the aircrew assessed the condition of the aircraft and passengers. They landed without incident.

Postflight inspection revealed that a section of the main cabin-door pressure seal had ruptured. The crew's execution of the descent and associated emergency procedures prevented a more catastrophic rapid-decompression event and kept the cabin altitude from exceeding safe thresholds.

VP-46

AS AWF2 JON COLLINS walked across the flight line, he noticed maintainers servicing the nose gear of a P-3C, while ordnancemen also were uploading a Maverick CATM onto the wing. Although they weren't in his squadron, AWF2 Collins chose not to ignore an unsafe situation. He addressed the issue on the spot with all involved. His attention to detail and assertiveness helped to correct this dangerous situation.

AWF2 Collins' actions reiterate that safety is not limited to one's own actions and daily work, but encompasses others and what they are doing. Ignoring a situation that isn't by the book, or that doesn't feel right, is just as bad as performing the unsafe act yourself. Petty Officer Collins is a good example of a positive safety culture at work.



If you wish to have an eventful, exciting flight, don't prepare for it, don't brief situations and responsibilities, and don't plan on things changing on you ...

But for those of us who prefer to keep things boring and uneventful, I recommend that you fly like you train, expect the unexpected, and have a backup plan.

— Lt. Trever Garabedian-Prophet, HSL-49