THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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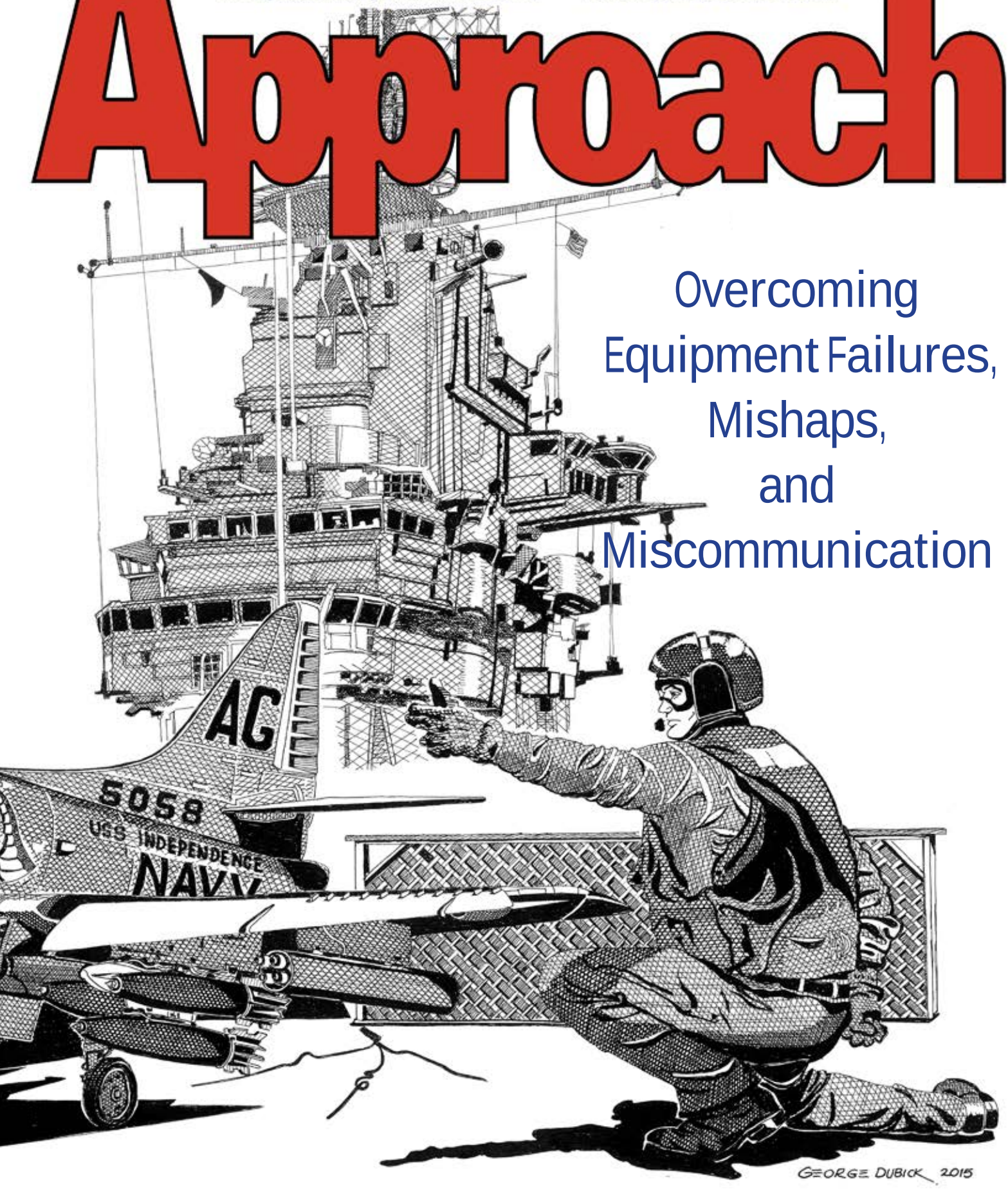
Approach

Overcoming Equipment Failures, Mishaps, and Miscommunication



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CONTENTS

Features

3. Avoiding a Balloon at 3,000 Feet
By LT Sean Anderson
A smudge becomes dangerously larger than life.

4. Nothing but a Shovel in the Jungle
By John Scanlan
Marines tackle the jungle to bring answers home.

8. Dutch Roll in the Conga Line
By CDR Dan Cochran
Sometimes having confidence is better than making quick decisions.

11. Effects of Nicotine use in Aviation
By LT Matthew Thayer Hall
Even top aviators risk their performance when nicotine is involved.

14. The Safety Stand Down: Reimagined
By LT Kevin Mazella and AM1 David Meador
The hands-on approach can be the best approach.

18. Not the Ideal Hawaii Vacation
BY LT Jake Hawley
Some vacations come as a surprise.

22. Tunnel Vision: Lack of Focus and Miscommunication Leads to Mishaps
By LT Katrina Nietsch
Not checking the blind spots could cost a life.

24. Which Way is Right When You're Flying Straight Up?
By LCDR Michael Miller
A pilot pulls his nose down into a collision course.

26. Passing Electric Wires at Night
By LTJG Robert Kaplan
An MH-60 nearly gets into a tangled web of wires.

28. Pending Hydraulic Failure - Immediate Pull Forward
By LT Ryan Hurlburt
The calm before a fire can be a warning signal.

31. The Not-So-Precision Approach
By LT David Farrell
Knowing how to read altitude could be the difference between life and death.

Mishaps cost time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous; the time to learn to do a job right is before combat starts.

NTENTS

Safety Stand Down Reimagined Pg. 14

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Departments

2. Editorial: A Change is Going to Come
By Nika Glover
A Look at the Way Ahead for Approach and Mech.

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Editorial

A Change is Going to Come

The Greek philosopher, Heraclitus of Ephesus, once said, "Change is the only constant". He was well-known for his doctrine that change was central to the universe, and he couldn't have been more correct because nothing endures like change. Here at the Naval Safety Center, we are undergoing some changes that will affect the future of this publication.

The good news is Approach isn't going anywhere. However, starting with the January-February we will be downsizing the Approach staff and combining magazines with Mech. The decision to combine publications gives new life to both Approach and Mech. The new format will allow aviators and maintainers to share each other's experiences. It will allow the maintainers to have six issues' worth of information versus just two.

We're also going to take a step backward in time back to when Approach was a comprehensive naval aviation safety review by adding new content along with the traditional "there I was" stories. We also understand that many of you read our magazine as you're preparing to fly. That means you don't always have the time to read a 2,000 word article. Therefore we will include more short stories and tidbits of helpful information.

The goal for the new magazine is to give you useful information, some safety and aviation history and news about what's happening in aviation safety today. As society becomes more visual, people find a page full of text less and desirable. So, you can expect to see more photos, information graphics and illustrations in the future.

Change can revitalize your perspective. Don't be bashful about sharing your opinions and responses to the upcoming changes. We will use them as a guide to continuously make improvements along the way.

Nika Glover

Editor, Approach and Mech magazines
Naval Safety Center

Avoiding a Balloon at 3,000 Feet

BY LT SEAN ANDERSON

It started out as a routine "Back in the Saddle" (BITS) flight with three instructor pilots (IPs) returning from holiday leave. The plan was to fly to Brooks Country Airport, a small civilian airfield about 50 miles southwest of NAS Corpus Christi.

Being close to the Mexican border, Training Wing Four (TW-4) instructors are aware of Department of Homeland Security (DHS) operations. DHS uses aerostats (similar to the Goodyear blimp, except smaller) for surveillance throughout south Texas. These aerostats can reach heights of 2,000-3,500 feet. They don't have navigation lights to identify them or their anchoring cables.

It was a beautiful, clear day. We picked up an IFR clearance from NAS Corpus to Brooks County Airport and requested the GPS approach to runway 35. This approach included a holding pattern in order to align ourselves with the final approach course. Reaching the holding waypoint heading outbound, I noticed what I thought was a smudge on the windscreen. I soon realized it was a DHS aerostat that appeared to be co-altitude with our T-44.

The aerostat was far enough away that we had sufficient airspace to adjust our pattern. We wrapped up our turn and the aerostat passed slightly below and to the right of our aircraft at 3,000 feet.

We landed and notified our safety department that the aerostat was not located in the position listed in the Notice to Airmen (NOTAM), which said that it was supposed to be 25 miles southwest of the field. Instead, it was 15 miles southeast and within one mile of the holding track. According to the Terminal Instrument Procedures (TERPS) manual, initial approach fix altitudes must provide 1000 feet of clearance within 4 miles of course and 500 feet of clearance for an additional 2 miles beyond the inner ring. If a training crew had flown this approach procedure at night, in actual instrument conditions (without a discernable horizon), or if they had been off altitude, this aerostat would have been a lethal obstacle.

Within an hour, our safety department had notified the chain of command, the FAA and Corpus Christi and Kingsville approach controllers. The squadron discontinued operations at Brooks County until the aerostat no longer posed a risk to flight operations. Within a day, a new NOTAM was entered into the database, notifying all air traffic (military and civilian) of the actual location and altitude of the aerostat. DHS was also notified, and within a week, they moved it to the originally published location.

Our encounter that day showed how quickly and effectively a safety department and command can act when faced with a hazard. I was proud of our squadron that day. This event reminded us that it is important to always be vigilant and that even in our own backyard we can face unexpected threats.

LT ANDERSON FLIES WITH VT-31.

Nothing but a Shovel in the Jungle

BY JOHN SCANLAN

As a retired Marine Corps aviator, I remember reading the issues of Approach magazine that lay around the ready room. I pitied the poor editor. I thought the Approach staff must get swamped with safety stories and that same thinking continued years after my retirement. Thus, I was going to wait until the twenty-five year anniversary of the following event before writing the story. I figured doing so might give me some leverage in getting it printed over the other stories. But then I thought no. This is a story that needs to be told now. So, there I was in the summer of 1992, in a Marine Corps F-18D squadron that was deployed to the Marine Corps Air Station in Iwakuni, Japan. Overseas deployments often involve participating in various exercises, and this trip called for the squadron to send six jets down to Paya Labar, Singapore.

Upon completion of the exercise, those six jets departed for the return to Iwakuni. Tragically, one of those F-18Ds went down in the Tanjung Kelesa jungle of Malaysia, where the pilot survived the ejection, but the back-seater died. Two days later, I found myself sitting in the back of a KC-130

transport with 27 other Marines. Flying ten hours back down to Paya Labar, we had two missions in life: recover that crashed F-18D and box up the parts.

What followed over the next two weeks was brutal. Working in the sweltering heat of the Malaysian jungle, we had to dig the jet's remains out of the ground with simple garden shovels. That was all we had! Then the parts had to be boxed up into wooden crates and placed in a primitive landing zone that we had carved out of the jungle.

The country of Malaysia was straight out of a movie script. Jeepneys, monkeys, heat, monopoly money… I kept expecting to see Indiana Jones at any moment.

Leonard, the Malaysian civilian contractor that the Marine Corps hired for us to work with, was a local version of the charachter Mr. Haney from the 1960's "Green Acres" sitcom. He initially acquired the garden shovels, which were later supplemented by pulleys, chains and an ingenious device called a "come-along."

It is a sobering sight when you first see an inverted F-18D buried nose-down all the way back to the afterburners.

While we recovered the F-18D, a small contingent

of Malaysian soldiers was assigned to encircle the crash site to protect us from tigers.

One day while digging, I found one of the pilot's running shoes and a book about the Civil War that he had been reading. By the sixth day we pulled the first wing out of the hole, and the next day we pulled out the second.

On Saturday, June 13, 1992, a Malaysian civilian work crew was contracted to improve the nearby landing zone. A handful of Marines and I were almost killed when that crew felled a tree in the wrong direction.

That same day, we removed one of the engines from the hole. The next day we removed the other. What a triumph!

Imagine our relief on the following Tuesday, when the last crate of F-18D parts was lifted out of the landing zone by a contracted civilian helicopter. We took a group picture behind a giant hole in the ground.

Two days later, I was sitting in the back of a KC-130 returning to Iwakuni, and I had nothing to do but think. What had I just learned? What was my take-away? I learned

Photos courtesy of retired U.S. Marine John Scalan

U.S. Marines retrieve an F-18D after it crashed in a jungle in Malaysia. The crew was only equipped with shovels to complete the task.

Photos courtesy of retired U.S. Marine John Scalan

ABOVE, BELOW: U.S. Marines use a helicopter to retrieve an what remains of a F-18D. The accident resulted in one fatality. The accident was so deep in the woods that trees had to be cut away to move it.

that families and the command need answers at all costs to prevent future mishaps, and there is nothing that hard working Marines can't do. I'd had friends die in aviation accidents before, but the jet always went down into water. So this crash zone gave us an opportunity to see the impact of a crash on land. It enabled us to retrieve the aircraft parts so an investigation could be conducted and answers could be provided to the squadron, the aviation community and most importantly the grieving family.

JOHN SCALON IS A RETIRED U.S. MARINE

DUTCH ROLL IN THE CONGA LINE

BY CDR DAN COCHRAN

It was a moonless night over the carrier as my air wing finished the last day of TALISMAN SABER, a 10-day joint exercise with the Royal Australian Air Force. The double-cycle, large force strike was executed as planned.

Completing my level off at 1200 feet during the CV-1 TACAN approach, I extended my gear at eight miles. It appeared the hardest part of the sortie was behind me. All that was left was to engage auto throttles, ride the ILS needles down the chute and keep the ball "energized" through the burble while maintaining centerline.

I was five miles behind the ship when I heard the ominous "Flight controls, flight controls" voice caution. My "E" bracket, which showed the relative angle of attack (AOA) to the desired AOA of 8.1 degrees, was gone. I'd also lost my AOA indexers.

What was the rule of thumb for on-speed AOA airspeed again?

The ILS centered up in my HUD and I started to descend. Bringing up my flight controls (FCS) page, I noticed "X's" in all four channels of AOA. The AOA caution and erroneous indications made sense now.

Passing 800 feet on glide slope I realized that even though the aircraft seemed to be flying okay, I needed to wave off and methodically go through the emergency procedure ensuring there were no surprises while on the ball.

Leveling off at 1200 feet, my representative in CATCC walked me through the two-page emergency procedure for four-channel AOA failure. Based on codes from the flight control computer (FCC), my right AOA probe was inputting bad signals. I isolated the probe by selecting the guarded GAIN ORIDE switch. When the left and right AOA probes disagree, the pilot can select fixed gains, optimizing flying qualities for two specific tasks – cruise and landing.

The FCCs use the position of the flap switch to decide which set of gains to use. Since my flaps were set to full, the FCCs were using the gains for landing, indicated by a LAND advisory.

Once configured, it was clear more than just the flight control gains were degraded. Instead of going to 30 degrees down and scheduling with AOA, the leading edge flaps were fixed at the two-thirds down position. This resulted in a FLAPS caution, since I was asking for full flaps but they were set with less extension.

Also, the rudder "toe-in" was gone, decreasing longitudinal stability and pitch authority in the case of a bolter. All autopilot modes were also inoperative. The most obvious degrade in handling qualities was the loss of "rolling surface-to-rudder interconnect" – the magic that allows Hornet pilots to fly with their feet on the floor.

The normally crisp and precise Hornet became victim to inferior aircraft handling characteristics

Photo by LT Christopher Nigus

of adverse yaw followed by a moderately damped Dutch roll. Normally rock-solid AOA stability wandered about on-speed, requiring small amplitude and long duration pitch commands to maintain 8.1 degrees AOA.The annoying degrades in flying qualities were just that – annoying – except for this: no auto-throttles!

Automatic throttle control, or ATC, is when the FCCs automatically keep the aircraft at 8.1 degrees AOA by providing timely throttle and flight control surface inputs. I had used ATC for every pass and continued for the two months since I'd returned to the fleet. This night's pass was probably my fortieth in the Super Hornet but my first with manual throttles – ever.

After configuring the aircraft for landing, approach vectored me to a hole in the conga line and again I found myself on final. Manually controlling the throttles, while dealing with wandering AOA along with coupled pitch and roll, filled my bucket to near the top. I got aboard first pass but did not impress the landing signal officers with my elegant airmanship.

As it turned out, having about 3,000 hours in 40 different aircraft and more than 500 traps in the "Classic" Hornet, I had accumulated enough experience to safely recover the aircraft. I debriefed maintenance quickly and hurried to place an order at the grill. My luck had changed – it was still open.

Over the years, I've noted skilled aviators make choices that create time during emergency situations. They slow the process down, only entering a critical phase of flight when confident in the plan and prepared for possible contingencies. In certain cases, "immediate action items" are required. However, in the vast majority of emergencies, time is available to carefully review the procedure with a copilot or wingman.

Talking through contingencies, such as a hook-skip or bolter, prepared me to make the correct flight control inputs. This is especially critical at night, where human errors following an aircraft malfunction can be catastrophic.

Astute pilots train and prepare for contingencies. Understanding the time would come where ATC wouldn't be available, I should have prepared by flying manual passes during the day with a fully-functioning aircraft. Thoroughly briefing and practicing degraded approaches (for me, manual throttle control) will provide experience and confidence when needed most.

CDR COCHRAN IS AN EXECUTIVE OFFICER WITH VFA-27

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Effects of Nicotine use in Aviation

BY LT MATTHEW THAYER HALL

It is no secret that an aviator's health is of huge importance to themself, to flight surgeons and to the military in general. Although medication use is a meticulously guarded aspect of aviation health, supplement use has more nebulous rules.

One supplement in particular has managed to fly under the radar since the beginning of aviation. Nicotine is a supplement/drug in common use, but there is little regulation or guidance regarding its use in aviation.

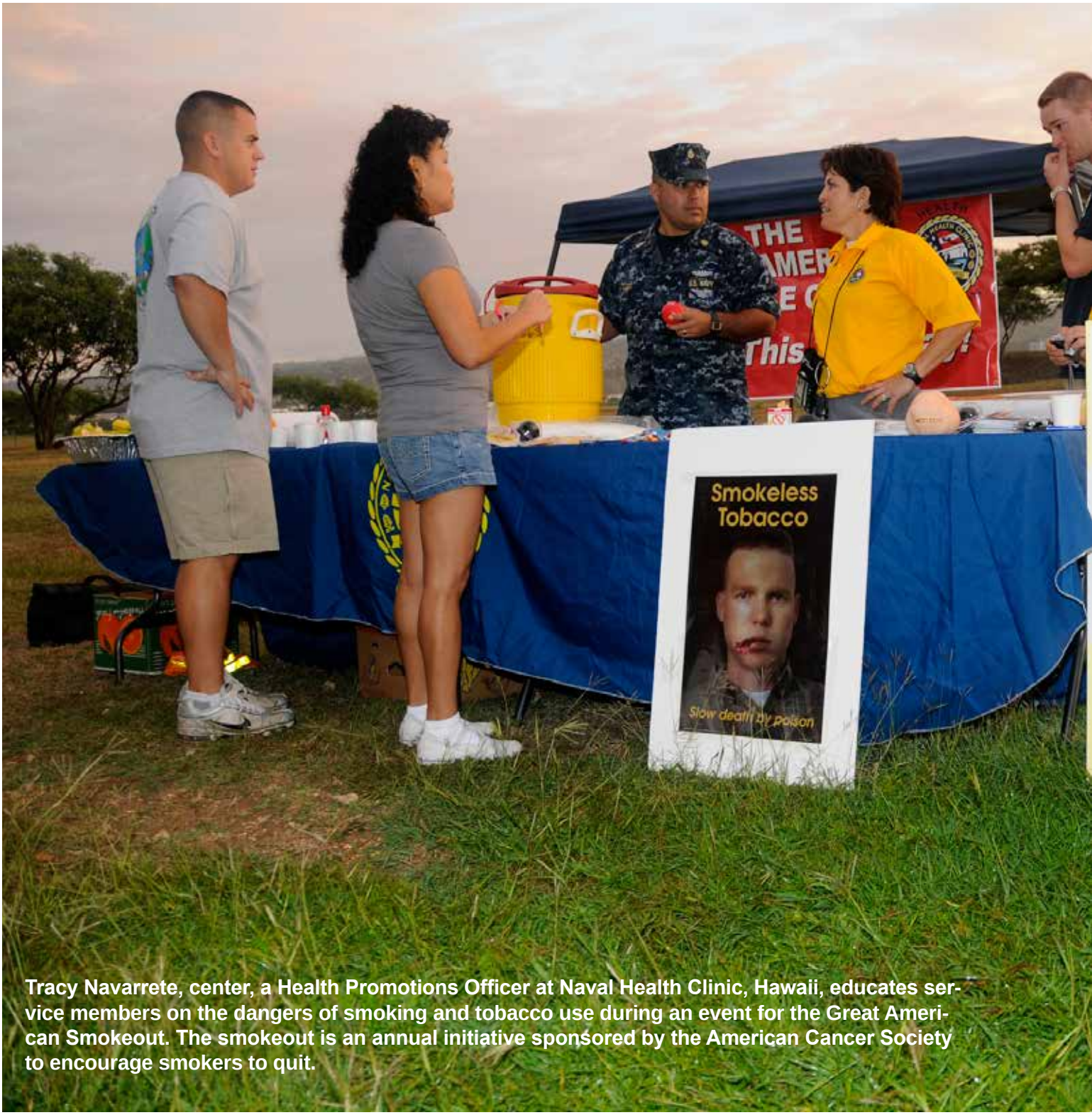
Nicotine is a chemical obtained commonly from tobacco products. Biochemically it has a simple structure. The power of nicotine to interact with the human body is profound. Neuroscientists have even labeled certain nerve receptors "nicotinic" due to their high attraction to the nicotine molecule. Nicotine also activates receptors in muscles, arteries, veins, lungs, intestinal and urinary tract.

Nicotine may be delivered into the body in a number of different ways. Cigarettes generally contain one to three milligrams of nicotine. Wit' the paradigm shift away from cigarettes and other tobacco products, the delivery method best described as "inhalation" is becoming increasingly common.

The biggest change in inhalation of nicotine has been the development of vaporizers (atomizers, e-cigarettes, etc.) which purportedly deliver nicotine without the harmful components found in traditional cigarettes. Nicotine may also be delivered transdermal (through the skin) with nicotine patches. Nicotine patches and gum, ranging from one to three milligrams per dose, are typically used to aid in smoking cessation.

Nicotine functions as a stimulant. Other notable stimulants include caffeine, pseudoephedrine, cocaine, MDMA, and meth amphetamines. Reported benefits of nicotine include increased concentration, appetite suppression, aiding in

Photo Illustration by Visual Information Specialist John Williams



Tracy Navarrete, center, a Health Promotions Officer at Naval Health Clinic, Hawaii, educates service members on the dangers of smoking and tobacco use during an event for the Great American Smokeout. The smokeout is an annual initiative sponsored by the American Cancer Society to encourage smokers to quit.

relaxation, and reduced pain levels. Benefits that would specifically aid in aviation include improved attention, learning and memory, as well as heightened alertness.

Nicotine rapidly passes through a person's circulation and into the brain where it activates the release of chemicals that stimulate the feeling of satisfaction and reward. Studies have demonstrated that the benefits of nicotine as a stimulant can be an aid in aviation, though only if used in select situations, such as a method of fighting fatigue.

The effects of nicotine in the body are paradoxical. Nicotine supposedly aids in relaxation but also may increase anxiety and alertness. Nicotine has been documented to be a stimulant and a sedative. The potential

Photo by MC2 Ronald Gutridge

complications of nicotine in relation to aviation are numerous. Neurologic side-effects include lightheadedness, headache, disturbed sleeping patterns, vertigo, and nausea.

Physically nicotine use can result in tremor, heartburn, and bronchospasm (making it difficult to breathe). Due to its vaso-constrictive properties, nicotine in the bocy increases blood pressure and may result in abnormal heart rates (all of which may be potentially disqualifying from aviation).

Nicotine decreases night-vision ability. The mechanism by which this happens is not entirely clear though it is suspected to be a result of constricting the blood vessels within the eye that supply light sensing nerves. For our big-deck aviators, using nicotine before or during a flight may make the difference between catching the wire and going into the big drink. For any aviator flying at night, it will worsen your visual ability.

There is no doubt that nicotine is highly addictive. While addiction itself is not necessarily harmful, it does perpetuate behaviors that may be. In the case of nicotine, an addiction will convince someone to smoke before a night flight or use the supplement before the PRT. In each case a new danger results: not being able to see as well and increasing the risks associated with high blood pressure such as bleeding in the brain and heart ischemia (essentially a heart attack), respectively.

Stimulants like caffeine have specific guidance; NATOPS restricts aviators to four to five cups of coffee or 150 milligrams of caffeine a day. Pseudoephedrine is a common medication given for congestion, but its use results in grounding. Cocaine, MDMA and methamphetamine are prohibited by numerous laws and their use will result in permanent grounding. Unlike those other chemical stimulants, very little regulation is made regarding nicotine use. As has already been described, the chemical can have very profound effects on the aviator.

NATOPS carefully notes the hazards of "smoking," stating that "Smoking has been shown to cause lung disease and impair night vision, dark adaptation, and increase susceptibility to hypoxia" but fails to identify nicotine as a possible etiology.

The "Bible" of flight surgeons, the Aeromedical Waiver Guide, classifies Class C substances (which include stimulants) as "not authorized for use" and considered disqualifying for aviation. However I don't think a flight surgeon that disqualifies aviators for smoking or nicotine use would be a flight surgeon for very long. The Manual of the Medical Department makes no mention of nicotine use at all.

The role of nicotine in aviation is unclear. Nicotine supplementation is widespread across not only aviation but the world at large. Like many things in medicine and aviation, there is no definitive answer to the issue of nicotine supplementation.

The best solution is to have a conversation with your flight surgeon in which your individual health is considered in the context of mission requirements and stressors.

LT HALL FLIES WITH FP-16

The Safety Standdown: REIMAGINED

BY LT KEVIN MAZELLA AND AM1 DAVID MEADOR

To the average Sailor, news of an upcoming safety standdown brings about groans, moans and an understandable state of general unrest. If you have been in the Navy for very long, you are all too familiar with sitting in an auditorium, listening to the same list of seasonal safety topics (grilling, traffic, or how not to burn down your house while frying a turkey).

As you make your way out of those auditorium doors and into the bright light, you hear plenty of negative remarks or snide comments about a "waste of time" or "I've heard that same presentation a hundred times."

Due to this negative connotation, the Wolf Pack of HSM-75 decided to take a new twist on the classic safety standdown—calling it a "safety round robin." The entire event was done in-house, using the squadron spaces and the collective knowledge of the Sailors attached to the command to facilitate a fast-paced, interactive, and enjoyable experience that included 10 integral, aviation-safety-related topics.

On the morning of the safety round robin, the squadron held a quick quarters where the skipper

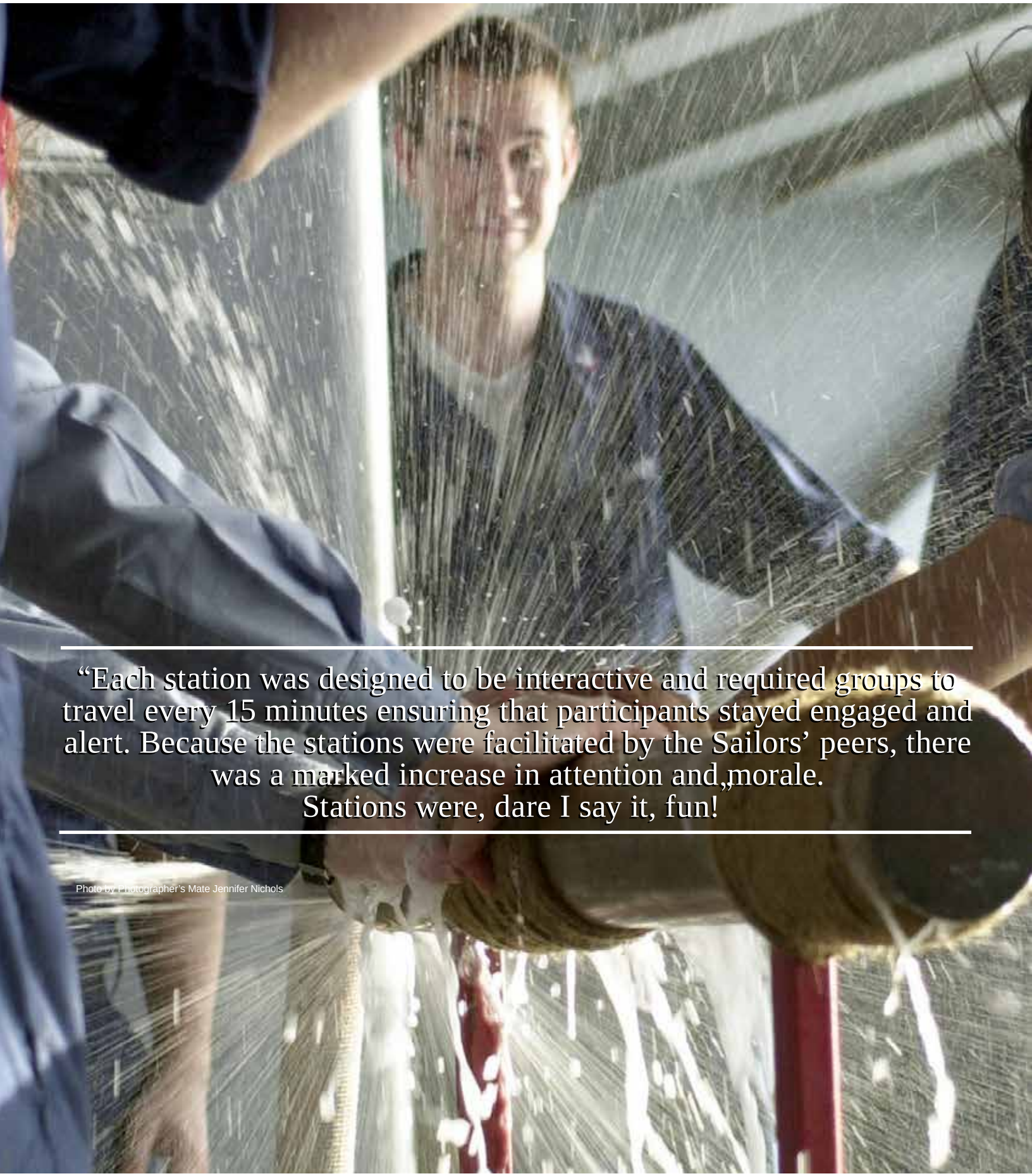
LCDR Charles Dittbinner II escapes the smoky fuselage of a P-3C Orion, assigned to Patrol Squadron (VP) 16, while conducting emergency landing and egress training during a safety standdown at Naval Air Station Jacksonville. (Photo by Chief Mass Communication Specialist Bill Mesta)

addressed the command. The command was then broken into 10 groups and assigned a group leader. Each group leader was given a schedule of events and a starting point.

Groups then proceeded to their first assigned station and the event kicked off. The groups traveled to predetermined stations around the squadron, from the hangar bay to the wardroom, participating in interactive events such as "Safety Jeopardy," spot the hazard on the aircraft, name that PPE, shipboard and flight deck familiarization, and maintenance-related ORM.

Each station was designed to be interactive and required groups to travel every 15 minutes ensuring that participants stayed engaged and alert. Because the stations were facilitated by the Sailors' peers, there was a marked increase in attention and morale. Stations were, dare I say it, fun!

The event was a resounding success, and we learned some lessons about how to improve. As with any safety stand down, planning is the key to success. This is even more important when coordinating a dynamic event in which Sailors are quickly transiting from one station to another. Mustering



"Each station was designed to be interactive and required groups to travel every 15 minutes ensuring that participants stayed engaged and alert. Because the stations were facilitated by the Sailors' peers, there was a marked increase in attention and morale.
Stations were, dare I say it, fun!

Photo by Photographer's Mate Jennifer Nichols

Photo by Photographer's Mate Jennifer Nichols

Photo by Photographer's Mate 2nd Class William Heimbuch

ABOVE: Sailors stationed aboard the conventionally-powered aircraft carrier USS John F. Kennedy (CV 67) participate in a safety, health and wellness standdown sponsored by Kennedy's safety department. The three-hour event focused on fitness promotions, general health and various aspects of personal and environmental safety.
LEFT: Seaman Magdalena Castillotorres, assigned to the ship's deck department, practices pipe patching damage control techniques during a safety standdown training event held aboard ship.

the stations proved to be an issue when it became apparent that some group leaders had a muster for each event while others only mustered their group at the first event they attended.

It was important when assigning topics to the presenters that they were fully aware of the schedule and did not go over their allotted times, causing bottlenecks during the day.

In the days following the event, the squadron's safety office polled squadron members about how they had liked it. The feedback was resoundingly positive. The vast majority responded in favor of the new format, saying they enjoyed the round robin and preferred it to sitting in a dark theatre going through endless PowerPoints. The topics highlighted their day-to-day jobs. By having it in the squadron spaces, it was easier for them to transfer the knowledge they received to their work.

While there still is value to the large group setting for discussing specific topics, we see this round robin format as a force multiplier to do periodically here at the Wolf Pack.

It proved to be a very successful and creative way to incorporate safety into the environment that our hard-working Sailors experience every day.

LT MAZELLA AND AM1 MEADOR ARE WITH HSM-75

Not the Ideal Hawaii Vacation

BY LT JAKE HAWLEY

Not more than two weeks into what would turn out to be a busy ten-month deployment in support of Operation Inherent Resolve (OIR), I found myself in a divert situation that would buy me a couple of days away from typical boat life in favor of the arduous living conditions of Hawaii. One evening, my flight lead and I launched from the deck of the USS Carl Vinson (CVN 70) to execute what was supposed to be a routine training flight in the waters off Hawaii.

Our mission was to practice the time-honored tradition of unguided air-to-surface roll-in attacks on the open ocean at night. In order to complete our training for the evening, we would first employ a pair of MK-58 marine location markers. We would use them as targets during multiple roll-in attacks with MK-76 light inert bombs. Rather than helping to preserve our night roll-in currency while keeping several of our readiness matrix blocks green, the markers and 76s would instead produce a basic NATOPS check for compound emergencies, a blown tire and a brake fire.

During the preflight brief, we spent a comfortable amount of time reviewing the local area, including the ins and outs of our divert airfields, the primary being Hickam Air Force Base in Honolulu, Hawaii. With all of this in mind, the brief, preflight, and launch all went off without a hitch. Once airborne, my flight lead and I quickly joined the flight and proceeded toward the working area. While en route we elected to complete as much tac admin as possible and initiated a "standard" G-warm. It only took about 4 G's and 90 degrees of turn before we were interrupted by the master caution light illuminating and the "engine right, engine right" audible warning tones. A quick "knock it off" call and a cursory scan of my cockpit revealed the master caution light to be illuminated. Further inspection revealed an R ENG caution as well as a full authority digital engine control (FADEC) advisory.

I quickly pulled the right engine throttle to idle and rolled the aircraft straight and level, I communicated my current predicament with my flight lead and requested

Photo by Photographer's Mate Tommy Gilligan

A pilot assigned to the Sunliners of Strike Fighter Squadron Eight One (VFA-81), completes final pre-flight checks on a AGM-65 Maverick missile prior to flight operations aboard the conventionally powered aircraft carrier USS John F. Kennedy (CV 67).

that he join on me as I worked to scan the engine page. The jet was flying fine with no control issues at all; however, I quickly noticed that my R ENG had been commanded to idle by the FADEC. This meant that the FADEC sensed a problem with the right engine, took control of said engine, and locked the N2 RPM at a flight-idle setting.

My flight lead and I confirmed completion of the immediate-action items. I turned the flight back toward the ship and worked to contact the CATCC rep for assistance with the remainder of the checklist. As user-friendly as a single-seat, Lot 30 F/A18E can be, I still found that trying to read a checklist at night while continuing to aviate, navigate and communicate results in a full bucket and a greater risk of misinterpretation of emergency procedures. In light of this, we contacted our CATCC rep who executed solid CRM and worked me through the checklist. He also had me check for engine responsiveness. Wherever I moved the throttle, the engine maintained a flight idle state with no response.

Based on the close proximity of a good divert and single-engine considerations at night, it must have been a no-brainer. I quickly got a divert and was on my way to Hawaii.

My flight lead planned to lead me into an approach to the open runway at Honolulu/Hickam. He then planned to execute a low approach and head back to the ship for a trap after I had made it safely on deck. We declared an emergency and put Hickam on the nose. I started adjusting fuel to arrive at an aircraft weight that was commensurate with a comfortable field landing and

worked through my ship-to-shore checklist. I was feeling at ease with how things were working out and anticipated an easy landing and shutdown followed by a night in Hawaii prior to the rescue det arriving.

The approach went as advertised, and I made a gentle landing near the beginning of the approach end of the runway, taking full advantage of the 9000-foot roll out. On touchdown I felt a sense of relief and applied a normal brake pressure all the way to the end of the runway.

Photo by Photographer's Mate Tommy Gilligan

A pilot assigned to the Sunliners of Strike Fighter Squadron Eight One (VFA-81) waits patiently in the cockpit of his F/A-18C Hornet for his turn to launch during flight operations aboard the Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75).

I didn't notice that my right engine maintained a flight idle N2 RPM of 73 percent instead of reducing to a normal ground idle of just over 61 percent. The increased engine RPM required an increased amount of braking. The increased friction generated heat that I failed to recognize.

After clearing the runway, I was instructed by the tower controller to hold position and wait for the civilian emergency vehicles. It took approximately 5-10 minutes for the emergency crews to arrive. Following a walk around and visual inspection, they reported nothing unusual. I was soon cleared to continue taxiing to the hot cargo pad at Hickam Air Force Base, where Hickam Air Force emergency crews would meet me with the intent of de-arming the MK-76 and maritime markers once safely in the contained area. The taxi to the hot cargo area was approximately 9000 feet and seemed normal.

As I pulled into the hot cargo pad, the emergency crew told me that my left tire had blown approximately 100 feet before I stopped taxing.

I noticed a flash of light under the left wing as a fire started on my left brake assembly. The crew quickly directed a stream of AFFF on the fire and put it out within a few seconds.

There are multiple learning points from this event. After landing rollout, during the subsequent hold-position evolution, a closer inspection of my engine parameters would have revealed a higher than normal N2 RPM.

This should in turn have raised a flag that increased levels of braking would be necessary, potentially causing additional heat generation from the brake assembly. Once clear of the runway, the best option would have been to secure the engine and coordinate a tow to the hot cargo area.

NATOPS doesn't cover every situation that aircrew may encounter. It is up to aircrew to build a solid understanding of aircraft systems and make educated decisions when compounded scenarios arise.

LT HAWLEY FLIES WITH VFA-81

TUNNEL VISION:

Lack of Focus and Miscommunication Leads to Mishaps

BY LT KATRINA NIETSCH

As pilots, we are all trained to know that attention to detail is critical. However, balancing the details with the big picture is often where situational awareness can be lost. One such incident occurred while I was the pilot performing preflight checks prior to departing for a CVN logistics mission.

We were 45 minutes past our scheduled takeoff time and still had to pick up passengers from the air terminal. We had just 10 minutes to spare to make our scheduled overhead time.

This delay contributed to a multitude of issues, including one of the aircraft becoming unavailable due to maintenance issues, ultimately requiring me to re-brief with a new crew.

After starting the starboard engine, the plane captain (PC)—who was under instruction—called for the main entrance hatch (MEH) on the port side of the aircraft to be secured. I gave him the thumbs up and continued with my checks.

I cleared the port side of the aircraft, ensuring that we were chocked, that the fire bottle manned, the MEH secured, and the prop arc clear. I called for the start of the port engine with the concurrence of the aircraft commander.

I did not see anyone in or around the MEH. I signaled for the start of the port engine and then started the engine after seeing the PC's signal to start the port engine.

With everyone's concurrence, I began the start sequence, and I looked in my mirror to check that the propeller began to rotate. Suddenly, I noticed a cranial in my mirror and immediately secured the engine.

I realized that the MEH was not closed and the

Photo Illustration by Nika Glover,
Original photography by Photographer's Mate Refugio Carillo

maintenance petty officer who was closing the MEH had no situational awareness as to the prop turning only a few feet away. A safety observer and a final checker on the line immediately grabbed him and removed him from the area on the left side of the aircraft.

After debriefing with the ground crew, we realized everyone had misinterpreted the hand signal as the signal to start up the port engine when in fact, the PC had been signaling that one of the maintenance personnel was on the port side of the aircraft.

When timelines become compressed due to scheduling and maintenance issues, aircrew and ground personnel must remain vigilant and focused in order to safely and efficiently accomplish the mission.

It is easy for pilots to get tunnel vision and attempt to expedite a launch evolution unwittingly at the expense of safety when they are eager to perform and meet timelines. Rushing is a common occurrence that often completes the "Swiss cheese" model of a mishap. In this case, expediting an already efficient process and expecting satisfactory results only compromised critical moments that would have been better used maintaining vigilance and attention to detail.

When unexpected events occur and cause us to feel rushed, it is of the utmost importance to identify that the holes in the Swiss cheese are lining up.

Delays can often be overlooked as a real-time ORM issue, and the "snowball effect" can be catastrophic if not mitigated by all members of the crew and ground support team.

LT NIETSCH FLIES WITH VRC-30

Which Way Is Right When You're Flying Straight Up?

BY LCDR MICHAEL MILLER

As soon as I stepped on the flight deck, I could see the solid gray overcast and knew the weather was not ideal for my red air flight. My flight lead and I had attended a mass coordination brief an hour prior in which we were directed to simulate "seasoned and aggressive adversaries." Essentially, training restrictions had been removed, and we were authorized to execute aggressive, three-dimensional maneuvering in order to arrive at a merge unobserved (thereby wreaking havoc upon the blue fighter formation).

However, given the look of the clouds, I doubted there was enough clear air to conduct a large air-to-air fight in the manner we desired, therefore favoring the fighters, in their mission, to attrite us.

My hopes improved as I climbed off the catapult. The cloud cover was widespread, but the overcast layer was higher than it looked from the flight deck. I completed my weapons checks for my particular red air simulation and joined my flight lead, a section lead under instruction who was only a few flights away from earning his section lead qualification. We proceeded to our cap and held below the weather at 14,000' and waited for the fighters to check in.

The fighters reported unworkable weather in the south and the bandits reported the same in the north. "Well, so much for this event," I thought glumly, quickly concluding there was no way to accomplish the training objectives for a large-force, air-to-air event.

The fighter lead reached the same conclusion. Over the primary frequency, he declared the event cancelled due to weather, and we all broke off into individual elements to pursue alternate missions. Normally, when assigned to conduct red air support, our squadron briefs 1v1 basic fighter maneuvers (BFM) if there is fuel and airspace available.

Thinking there would be no way to execute BFM with the surrounding weather, my flight lead sighted a clear pocket of airspace about 10 miles in diameter and below a high overcast layer with a clearly defined horizon. Having briefed the requisite training rules as well as position, altitude, distance and speed (PADS) for our engagements, we suddenly became the recipients of a dedicated 1v1 BFM hop. I eagerly began adjusting my displays and recorders, preparing my cockpit for dynamic maneuvering. I had no way of knowing that in a few minutes I would be roaring upward into the vertical, gripping the controls in sheer terror.

Our first engagement was benign and ended with us both arriving neutral on the deck. It was clear that neither of us were likely to gain a decisive positional advantage so we knocked off the fight.

The second engagement began much the same as the first. After a second neutral lateral left-to-left pass at approximately 9,000 feet, my flight lead elected to roll wings level and execute a pull into the vertical. For those not well-versed in FA-18 BFM doctrine, a pure vertical move can be decisive if the adversary can't or won't make a follow-on merge due to either lack of energy or lack of recognition.

However, if properly countered, as I was preparing to do, the lower aircraft can quickly turn the tables by using the effects of gravity to rapidly reverse out of the vertical following the upcoming low-to-high merge.

As a former topgun instructor, I relished moments such as these where I had the opportunity to win a fight decisively and illustrate a fundamental learning point in terms of flow and decision making.

However, as I pulled up into the vertical, I witnessed something that was first unfamiliar… then outright terrifying. As my flight lead completed his over-the-top maneuver, I placed him just outside my right canopy bow. I was looking up at the top of his aircraft as his

nose was pointing to my right, out of the vertical. I expected that he would ease his pull and extend a bit to my right in an attempt to flatten out our upcoming pass. However, I watched in horror as he increased his pull nose low in front of my flight path and I found myself staring up at the underside of his jet falling rapidly towards me.

Although my flight lead had not called "blind" on the radio, I knew immediately that he had likely lost sight of me as I could no longer see his canopy.

By pulling his nose down and across mine, we were now on a collision course with more than 400 knots closure. I distinctly remember thinking, "Oh my God, we're going to hit," as my stomach turned over with the flood of adrenaline into my system.

I could not think of anything to say on the radio to help him avoid my aircraft and simply tried to keep my flight path predictable.

As we closed to within a few thousand feet, my flight lead finally gained enough airspeed to roll 180 degrees to the left and regain sight. Observing my slow roll to the left, he pushed his stick smoothly forward and right, opening up our flight paths to a 400-500-foot pass in the vertical.

My mouth was dry and it took me a few seconds post 3-9 line passage to finally make a "knock-it-off" call on the radio. We recovered aboard the aircraft carrier uneventfully.

OPNAV 3710 as well as the Joint Typewing Core SOP both provide clear and consistent training rules and procedures for flight path de-confliction. In the case of a head-on pass, fighters are directed to maintain the established trend. If no trend exists, give way to the right to make a left-to-left pass. If there is any doubt about the "established trend," fighters are instructed to transmit their own intentions.

In order to alleviate confusion between left and right when aircraft are upside down, the pass should be called "earth-stabilized." If two aircraft meet at the top of a loop it may look like a right-to-right pass to an inverted pilot but should be called left-to-left (God's eye view). If the pilot is disoriented, he should roll wings level. The final de-confliction measure applicable in our case states that forward-quarter radar-lock attempts shall not be attempted inside of 1.5 nm, which my flight lead later told me he was attempting to do when he crossed in front of my projected flight path.

At first glance, it would appear that my flight lead blatantly violated these training rules in rapid succession. It appeared to me that we had a right-to-right trend established which was not maintained. Specifically, his forward-quarter radar lock taken inside of 1.5 nm denied flight path de-confliction, resulting in a "blind lead turn," or an intentional maneuver to lose sight. However, upon review of our heads-up-display (HUD) footage, I was surprised to see how insidiously this situation developed in my flight lead's cockpit. While it was still a training rule violation, his jet clearly seemed to "fall" into this unsafe situation rather than being carelessly or over-aggressively placed there by pilot action.

He explained his intent was to achieve a radar lock at what he assessed to be approximately two nautical miles. However, he was slow and it took longer for his nose to track. His pitch control was so sluggish he overshot causing his predicted flight path to cross mine.

This pass appeared to me right-to-right. However, in a steep merge, earth-stabilized "left" and "right" lose meaning. Traditional communication may not be effective. Care must be taken during BFM instruction to brief the characteristics of reduced nose authority when nose high or when pulling out of the vertical nose low. Expect sluggish pitch control and ensure deconfliction by keeping the other aircraft out of your HUD. Consistently safe vertical merges can be accomplished following these guidelines.

While we didn't learn as much on this hop as the fighters would have learned from the "seasoned and aggressive" game plan we had developed, we learned an important lesson about BFM. Air- to-air training is important to be ready for future conflicts. With proper teaching and effective briefing, we can safely train aggressively and realistically.

Passing Electric Wires at Night

BY LTJG ROBERT KAPLAN

Flying in the night TERF environment in an unfamiliar location is like you and a friend picking up Roman candles, walking twenty paces, turning around and lighting them off at each other. Most will miss, but eventually you'll get scorched in the face. Only in this environment, negative results are much worse than scorch marks. If you hit an obstruction, the result can be a fireball.

The only way to know your environment at night is through studying maps, referencing obstructions, flying a range fam during the day, or receiving an extensive pass down from a prior crew that flew in the same op area. In combat, all of these actions aren't possible, but in the training environment, all "should" be and every effort "shall" be.

During HSC-8's PR/SOF detachment to El Centro, the Swiss cheese holes lined up to produce a situation that could have killed our entire section. The mission lead was a senior department head instructing a senior JO HAC on an initial PR LVL III grade card. I was flying in the Dash 2 position, right seat (designated stick monster) with our SWTI Super JO running the CSAR scenario from the left seat. I had already finished the LVL II PR/SOF syllabus and was confident in my stick skills. However, this was night one of the mission phase, and I had not flown a day TERF in the operational area yet. I was instead jumping in the saddle on a relatively high-light night as the designated stick-monster to build my proficiency.

The brief appeared to be thorough, with an in-depth route brief that covered our scheme of maneuver, expected LZs and any hazards that were on our route of flight. This included numerous sets of wires and towers that lay to the east of the airfield and en route to our terminal area. Having been the previous JMPS officer, I was familiar with the charts and had studied the area so that I wouldn't be caught with my pants down (not a good look by any means).

The brief, however, omitted the fact that we were not going to our planned LZ but to a pop-up location of the survivor at an alternate LZ — an alternate LZ that had an unlit, 150-foot set of wires running alongside the southern edge that was uncharted on eCHUM or Manual CHUM. The good thing was that the mission lead had seen this LZ the day before on a range fam and had made note of the wires. The bad thing was that he did not communicate this to the other crews on. The holes in the cheese were starting were to align.

> "No one in my crew saw the wires, and no one realized the severity of the hazard until we had RTBd."

We briefed a route altitude of 150 feet AGL. I can definitely see through the holes of the cheese now. It's not just a good Swiss, it's now high-end Emmentaler from Whole Foods.

Our ingress route was non-eventful. It was a pleasure to fly as we dipped and dove along the terrain, maintaining cover from simulated enemy threats. We were in our element, taking the fight to the notional bad guys and flying low and fast. It was a completely safe evolution until the LZ. We entered the terminal area as a section abeam with a quarter-mile separation, and as the southerly aircraft, we executed our preplanned split due to not seeing the survivor. My aircraft split toward the south and turned straight into the wires.

The only thing that saved us from hitting a thick set of electrical cables was having cultural light from the city of Yuma degain my NVGs. In those two seconds, I had a gut instinct, which was "Can't see, got to pull power, why not go high?" before rejoining. The event reconstruction placed us about 50 feet higher than the lines going through the turn overhead.

No one in my crew saw the wires, and no one realized the severity of the hazard until we had RTBd. The other crew did not see the set of wires as they entered the zone, and there was no communication made between the aircraft regarding the hazard.

There are several learning lessons to take away from this near-calamity. First, use every available hazard tool for preflight planning. Not just mChum and eChum as per TypeWing SOP, but also use VVOD data from the NGA. It shows a lot more of applicable hazards. Second, if an alternate LZ is to be used, inform the other crews. Flying at night, at low altitude, is a zero-sum game, you either execute or you ball it up. If there is a hazard, everyone needs to know about it. Third, never be too confident in your abilities, and trust your gut.

Overall, ensure that communication flows between pilots, aircrew, and mission planners to ensure that we fly our aircraft safely and to their maximum performance without accepting unnecessary risk that we bring on ourselves. Our modus operandi is "Fly, Fight, Win". You cannot do that if you're strewn alongside magnesium alloy transmission housing.

LTJG KAPLAN FLIES WITH HSC-8

Photo Illustration by Visual Information Specialist John Williams

An MH-60 Sea Hawk helicopter almost flies into a set of electrical wires during a night flight.

BY LT RYAN HURLBURT

It was the first week of combat ops and we were launching from a carrier in the Arabian Gulf. We were scheduled for a single-cycle unit level training (ULT) flight in the late afternoon. The man-up was routine with the exception of the multi-function information distribution system (MIDS), which was giving us some issues, but nothing that would cause us to cancel the event.

After leveling off at 500 feet during the Case 1 departure, we lost MIDS (including the TACAN). With the last known TACAN DME between four and five, we drove out for another minute, and then began our climb.

The combat information center officer (CICO) started to troubleshoot MIDS as we executed our normal climb out. Passing through 2,000 feet, we entered a non-convective cloud layer. We broke out of the layer around 10,000 feet and continued up to 20,000 feet. Between 10,000 feet and 15,000 feet, I asked the copilot if he noticed an odd smell. This was my first time flying in the Gulf and first time in many years for the copilot. After a brief discussion, we thought it may be the smell of dusty cloud moisture over-saturating the AC compressor.

As this discussion was going on, the air control officer (ACO) went into the forward equipment compartment to reseat the cables on the back of the MIDS box. We were talking to the CICO to let him know we still did not have a working TACAN and that it may be an issue with the ship. Our playmate from the event prior was not receiving TACAN either. The ACO finished her troubleshooting and headed back to her seat.

The CICO and radar officer (RO) were having the same conversation that we had up in the cockpit about an unusual smell. We started to level off at 20,000 feet. The smell was getting stronger. We discussed turning off the air conditioning to see if the odor went away, but we decided not to since it would cause the aircraft to lose cabin pressurization. In a matter of seconds, white smoke built up in the cockpit. As we notified the other three crew members, the master caution illuminated along with the flight HYD quantity light. We had to land immediately.

The copilot directed me to start an immediate descent back towards the ship as he declared an emergency with tower. The whole crew connected their oxygen masks and internal communication system (ICS) within 30 seconds, and the smoke continued to get thicker for the next minute of descent. The copilot told everyone to start preparing for bailout in case the

Pending Hydraulic Failure-Immediate Pull Forward

Sailors spray down a training E-2C Hawkeye during routine aviation damage control training.

Photo by MC3 Zachary Montgomery

emergency got worse. We all hooked up to our seat pan oxygen and tightened all straps. At that time, I was in a descent not knowing where the ship was located and heading directly towards territorial airspace of another nation. The copilot took the controls, maneuvered us from the warning area and asked for vectors.

Prior to this emergency, the copilot had the T40 tactical screen selected on his primary flight display (PFD). The center screen was selected to display engine gauges and warnings, cautions or advisories. My screen was set up with the standard attitude direction indicator (ADI) and horizontal situation indicator (HSI) display. During the descent, in an attempt to isolate the smoke/fumes, we turned off both generators that transitioned the power source to the emergency generator. On the emergency generator, only the pilot and copilot PFD are powered. In this scenario, the copilot had the tactical display screen up, which secured when

Photo by Photographer's Mate Scott Campbell

An Aircrewman aboard a Carrier Airborne Early Warning Squadron One Two Five (VAW-125) E-2C Hawkeye tracks air and surface contacts while in flight. In addition to performing their required mission assignments, aircrew must also be prepared for all onboard emergencies.

we turned off the generators. Now he was flying cross cockpit, looking at the gauges on the opposite side of the cockpit, and neither of us could figure out why we only had one working PFD. The copilot elected to turn on one of the generators since we now believed the smoke was related to the hydraulic issue. We switched the center PFD to display an ADI so it would be easier for him to scan that screen.

As we broke out of the cloud layer, we could see the ship at four miles. At two miles we had finally calmed down, realizing we still had good HYD pressure, and the smoke had settled enough to execute a safe landing. During configuration for landing, we realized our fuel load indicated 10,500 lbs. NATOPS prohibits us from landing above 5,100 lbs. with five crew members.

The copilot and I discussed landing heavy, but we quickly determined that we might part a wire or break the hook point if we tried to land with the current fuel load. I turned the fuel dumps on and did a 360 behind the ship to buy time for jettisoning fuel. With a HYD light still staring us in the face and being only 5 minutes removed from a serious discussion about bailing out of the plane, we decided to land with a fuel state of 5.8 instead of taking another lap to dump down another 700 lbs.

After a safe recovery, there was enough hydraulic pressure to raise the hook and fold the wings, though they were sluggish. Maintenance found the flight HYD return line had stripped itself from the threading and was leaking into the nacelle. It was only a matter of time before we would have lost pressure and had a total flight hydraulic failure.

Getting on deck expeditiously helped us avoid a bailout scenario. Had we needed to get out of the plane, I have no doubt we would have been successful. Just one week prior to this flight, we did bailout drills with all aircrew on a static bird in the hangar. This training was meant to emphasize the importance of communication and survival gear knowledge, to egress all five crewmembers judiciously. Our emergency could have put us in a bad situation very quickly. However, good CRM and a thorough knowledge of systems and emergency procedures allowed us to recover uneventfully.

LT HURLBURT FLIES WITH VAW-125

The Not-So-Precision Approach

BY LT DAVID FARRELL

In aviation, accurately knowing aircraft altitude is paramount. Most aircraft measure altitude using two sensors. The radar altimeter (RADALT) electronically measures the aircraft height above the ground (or sea) by measuring the round trip timing of radio waves from the aircraft to the ground and back. The barometric altimeter (BARALT) uses the static pressure measured by the aircraft's static port(s) to quantify the aircraft's altitude above mean sea level. If all else is equal, the BARALT and RADALT should both indicate the same altitude when flying over the ocean. However, throughout hundreds of flights that I have flown as an MH-60R instructor pilot, consistent discrepancies existed between the BARALT and RADALT in each aircraft I have flown.

Altimeter-Setting Error

Pilots use the local altimeter setting (based upon atmospheric pressure variation) for calibration prior to flight. On deck, calibrating the BARALT to the local altimeter setting is supposed to cause the BARALT to indicate the airfield elevation within plus or minus 75 feet. If it doesn't, the accuracy of the altimeter is questionable, and the device must be repaired. Even more restrictively, the MH-60R integrated electronic technical manuals (IETMs) dictate an error limit of plus or minus 60 feet before maintenance action is required on the BARALT.

In my experience, the MH-60R BARALT consistently indicates within plus or minus 10 feet of the correct elevation on deck, well within the limit dictated by the AIM or IETMs.

This is not the case, however, in forward flight. When flying at mid-range airspeeds (50-100 knots indicated airspeed, KIAS) often used for instrument approaches, the MH-60R BARALT indicates 40-to-60 feet (nominally 50 feet) lower than it should. For example, in level flight over the ocean at 90 KIAS and with 200 feet indicated on the RADALT, the BARALT will indicate a mere 150 feet if calibrated to the local altimeter setting. However, neither the AIM nor the IETMs dictates an allowable BARALT error limit in flight because they assume a similar error on deck and in flight. In the MH-60R at least, this assumption does

Photo by Mass Communication Specialist Seaman Apprentice Tyler Caswell

Aviation Electronics Technician Airman Apprentice Zachary Hoying checks the low altitude warning light on a radar altimeter indicator.

not hold true.

Source of the Error

The exact cause of this error is unclear, but basic knowledge of the BARALT's pitot-static system tells us that the static port of the BARALT system must be experiencing an artificially high local pressure compared to the co-altitude ambient air pressure. It is likely this error was present in older H-60 models with the same physical pitot-static system (SH-60B, SH-60F and HH-60H to name a few), but has only recently been observable due to the discrete, digital readout of altitude in a glass cockpit. Note that the MH-60R and MH-60S have different pitot-static systems; this article only describes an error in the MH-60R's system.

The MH-60R's Not-So-Precision Approach

During a precision instrument approach, a 50-foot altitude error is not negligible. For example, on a typical precision instrument approach with a 3 degree glideslope and published decision height (DH) of 200 feet, a 50-foot error in the pilot's altitude indication raises the ceiling requirement to successfully conduct the approach by 25 percent, and the visibility requirement by nearly 40 percent. But that is not all. To fully understand the implication of this BARALT error, one must also consider runway approach lighting. Actual instrument approaches are flown when instrument meteorological conditions (IMC) prevail. At night and during IMC, airfields turn on runway approach lights to help pilots visually acquire the landing environment before the aircraft ever reaches the runway's landing threshold.

Let's examine the affects of the MH-60R's known BARALT error on the ability of a pilot to visually acquire the runway approach lighting when conducting a precision instrument approach to one of the Navy's busiest airports: the precision approach radar (PAR) to runway 36 at Naval Air Station North Island (KNZY).

Figure 1 shows that a pilot conducting this instrument approach may never see the runway or its approach lighting when 200 feet is indicated in the cockpit. The MH-60R is nearly twice as far from the runway and almost six times further from the approach lighting as intended by the FAA-approved instrument approach procedure. "Precision" is loose term for such an approach.

The Good News

First, the opposite error would be much worse. If the BARALT consistently indicated higher than the RADALT, then pilots using the BARALT as their primary altitude instrument would think they had more clearance from the terrain below than they actually do. Such an error could result in controlled flight into terrain (CFIT).

Second, the instrument approach procedures to ships do not rely on the BARALT. The MH-60R NATOPS flight manual explains that the RADALT, not the BARALT, should be the primary altitude instrument when flying an instrument approach to a ship. This procedure already mitigates the effects of inaccurate information from the BARALT. Most other naval aircraft also use their RADALT primarily during approaches to naval vessels.

Third, the error has less effect on TACAN approaches. During a tactical air navigation (TACAN) "non-precision" instrument approach (used during instrument approaches to Navy vessels and military airfields) the BARALT error only results in elevation inaccuracy, not horizontal distance error. Horizontal distance during a TACAN approach is measured by distance measuring equipment (DME), which is not susceptible to the BARALT error described above.

The Bad News

First, MH-60R pilots must learn to manage their BARALT error. An in-flight technique used over the ocean to instantaneously synchronize the BARALT to the RADALT is called a "BARO SYNC". This works

well in the specific situation of over-ocean flight, but pilots must keep in mind that doing so changes the altimeter setting of their BARALT in order to match the RADALT. Over the ocean, which altimeter setting should a pilot use? The local altimeter setting previously calibrated on deck? Or the one that indicates the correct altitude in flight? This difference can be significant. It is nominally 0.05 inches Hg, corresponding to 50 feet in elevation.

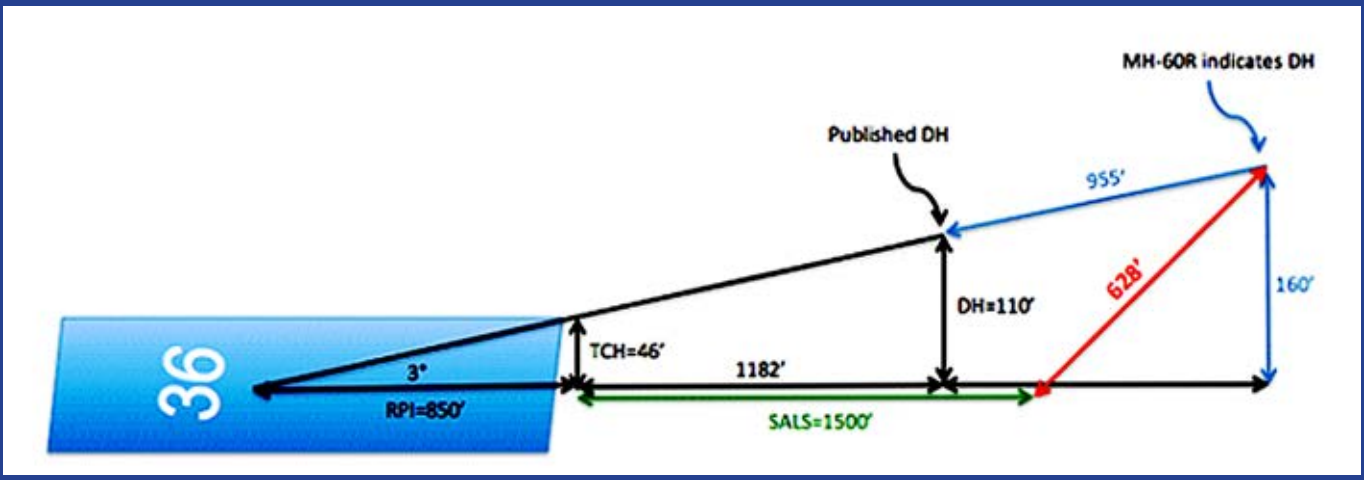
Second, DH/MDA determination is no longer black & white. During any PAR if the runway environment is not in sight when the pilot BARALT indicates the DH, should the pilot wave off immediately or wait to make the decision until the approach controller verbalizes "at decision height?" During a typical 90 KIAS instrument approach, the amount of time between the BARALT indicating the DH, and the approach controller verbalizing "at decision height" is about six seconds, or nearly one-fourth of a mile of aircraft travel. Would waiting until the approach controller verbalized "at decision height" violate OPNAVINST 3710.7U section 5.3.5.4, since it prohibits descent below the DH/minimum descent altitude (MDA) unless the runway environment is in sight and in the pilots judgment a safe landing can be made?

Would a pilot violate the same OPNAVINST 3710.7U section if they descended 50 feet below the MDA during an over-land TACAN approach to "correct" for the BARALT error? I would never advocate violating OPNAVINST 3710.7U, but the knowledge of this BARALT error puts pilots in a dilemma that needs discussion both inside and outside of the MH-60R community.Third, flight simulators do not replicate this error. The BARALT error is only observed in the MH-60R aircraft itself. Aviators governed by OPNAVINST 3710.7U know section 13.2.1.f well, which states, "approved flight simulators… may be utilized to meet one-half of the minimum instrument rating requirements." Therefore, pilots could become desensitized to the necessity of managing their altimeter setting in the aircraft because (up to) half of their instrument training each year is in a flight simulator.

A Small Error with Big Implications

Although the aerodynamic explanation for this BARALT error in the MH-60R remains unclear, it is essential for all MH-60R pilots to observe its existence and consider strategies to mitigate its effects. A robust discussion is needed amongst MH-60R pilots to consider the legality and risk versus reward of determining a DH or MDA with any method other than a BARALT calibrated to the local altimeter setting. Further, it is important for pilots of all instrument-rated aircraft to observe if the aircraft they fly is susceptible to any consistent BARALT errors. The implications of what may seem like a small BARALT error can have a very large Effect on safety of flight.

LT FARRELL FLIES WITH HSM-41



The PAR approach at KNZY has a published DH of 110 feet, a threshold crossing height (TCH) of 46 feet, and a runway point of intercept (RPI) of 850 feet. It uses a 3° glideslope. The runway has a short approach lighting system (SALS) installed, extending 1500 feet prior to the runway threshold. The published DH is located 1182 feet from the runway threshold, more than 300 feet into the SALS (shown in green). At the published DH, the straight-line distance of the aircraft to the SALS is simply the height of the aircraft above the ground (110 feet). However, in the MH-60R, a pilot indicates that they've reached the DH nearly 955 feet from the published DH and 160 feet above the ground (shown in blue), at a distance of 628 feet from the closest approach lighting (shown in red).

"OVERALL, ENSURE THAT COMMUNICATION FLOWS BETWEEN PILOTS, AIRCREW, AND MISSION PLANNERS TO ENSURE THAT WE FLY OUR AIRCRAFT SAFELY AND TO THEIR MAXIMUM PERFORMANCE WITHOUT ACCEPTING UNNECESSARY RISK THAT WE BRING ON OURSELVES. OUR MODUS OPERANDI IS 'FLY, FIGHT, WIN.'"

— LTJG Robert Kaplan

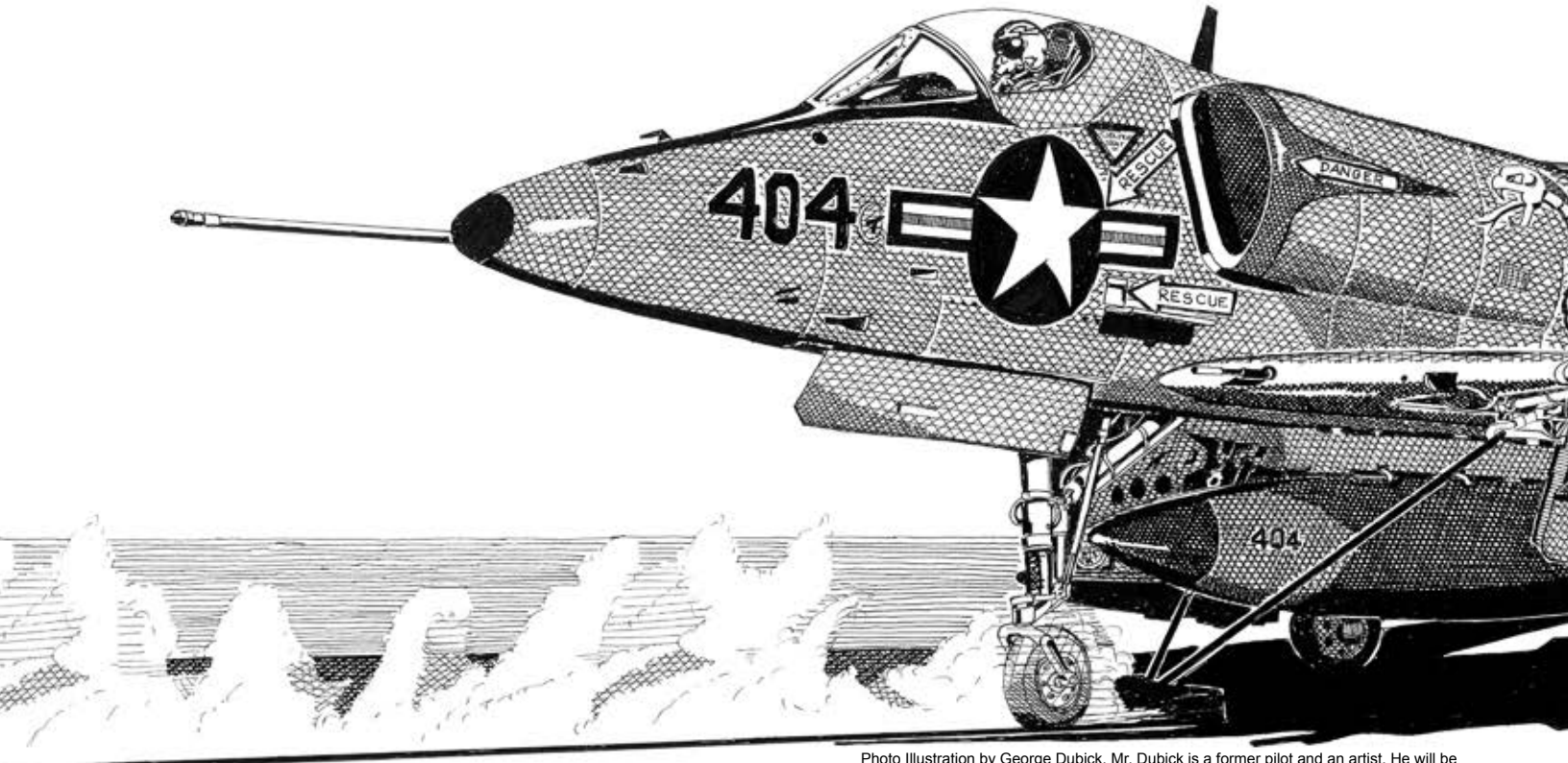


Photo Illustration by George Dubick. Mr. Dubick is a former pilot and an artist. He will be featured in the January-February issue of Approach.