THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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Approach

The Blue THREAT

The Initial Approach Fix

Execute the Plan

Cold and Quiet at Angels 16

The Navy & Marine Corps Aviation Safety Magazine
November-December 2006, Volume 51 No. 6

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

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The Blue THREAT

By Capt. Ken Neubauer

Picture this scenario: You are in a training meeting in your squadron ready room. The safety officer stands up and tells how the squadron is doing to keep your Sailors or Marines safe, and the things you need to do to make sure you are not the next victim of a mishap. Do you listen? Does the aviation-safety officer (ASO) carry the credibility to command your attention and change your thinking? Is your safety officer a hot-runner, hand-picked by the CO to lead a charge?

When I wore a younger man's rank, the answer to each of these questions typically was a resounding no. The safety officer's pitch was just more of the same, utterly predictable, and I rarely listened. After all, the safety officer was supposed to talk about safety. That was his job.

Let's alter the scenario. Let's say you are in the same training meeting, but, this time, your training officer, the strike-fighter-tactics instructor (SFTI) or the weapons and tactics instructor (WTI), stands up and begins to speak. Do you listen now? The answer likely is yes. Not just yes, but absolutely. Why? For the same reasons cited before: The training officer carries credibility, is likely hand-picked to lead a charge, and he is talking about tactics—stuff you like and want to talk about.

What if we were to get these two guys together as a team? What if training officers and the safety officers both talked tactics? From my former seat as director of the Naval School of Aviation Safety, that prospect was but a dream—a distant land far away, across a treacherous sea filled with cultural dragons.

Then, on a clear California morning two-and-half-years ago, that vision materialized with a single phone call from an innovative Marine Corps tactician, who just happened to be the commanding officer of Marine Corps Weapons and Tactics Squadron One (MAWTS-1). Col. Jon "Dog" Davis said, "Nubs, can you help me develop a two-day course in safety and risk management that could be presented to the future weapons and tactics instructors (WTIs) of the Marine Corps?"

You might imagine my reaction. I calmly replied, "Sure," as I tried to keep myself from falling out of a third-story window while leaping for joy. Finally, naval aviation was about to get our brightest tactical minds engaged in the fight against our deadliest enemy: ourselves.

The vision that came from the School of Aviation Safety (SAS) and MAWTS-1 partnership was to treat the causes of mishaps as threats in the same way we deal with protected targets or enemy fighters: You defeat threats with sound tactics. When you start talking tactics to warfighters, they tend to listen.

Think of the energy we put toward winning battles with potential foes. We go to tremendous lengths to devise tactics against them. We train and modify our tactics, depending on the part of the world, the time of year, and the time of day we expect to fight. These warfighting tactics are developed and practiced by our forces, our blue forces, to defeat that anticipated force. We often refer to this opposing force as a red force or Red Threat. In my 20 plus years' involvement in naval aviation, I was able to employ red-threat tactics, for real, one time for a period of five weeks. The world has

changed a bit in the last five years, but I think it's safe to say our naval aviators' exposure to red forces is, by any stretch, limited.

Now, let's take this same mindset and apply it to hazards. What if we were to view the hazards we face every day, in training or in our everyday activities, as threats? Take marginal weather for example. Bad weather is a hazard to the success of our operations. Do we have measures or controls in place to minimize the risk to mission success or loss of assets posed by bad weather? Certainly, they are our tactics against a known threat. How about fatigue, or inexperienced aircrew flying together? We need to view these as threats to our ability to accomplish our missions in the same way we view a weapon in the hands of someone in violent disagreement to our way of thinking. These are the Blue Threats, threats or hazards we create or are under our control to modify their effects.

History shows that, even in the face of combat conditions, we lose far more of our forces to Blue Threats than we ever do to Red Threats. Think of all the aircraft crashes, injured personnel, or damage to equipment that occur during training. These losses, more times than not, have nothing to do with the actions of an opposing force. They are, in the vast majority of cases, due to our most deadly Blue Threat: human error.

To defeat Blue Threats, we need sound tactics. One key tactic is operational risk management. ORM is a process, a tactic, to manage the risk posed by the threats or hazards we face in preparing to meet an enemy force, or in our everyday activities. ORM will ring with the warfighter, with the risk-taker, if viewed in this manner.

From these seeds sprang the Tactical Risk Management (TRM) course at MAWTS-1. The goals of this effort are:

- To reach the warfighter, to bring a mindset of safety and risk management as a force multiplier and enhancer to combat effectiveness.
- To bring concepts that typically were viewed as mundane and burdensome safety initiatives to the interest of our hard-charging warfighters.
- To enlist leading-edge junior Marine aviators in the fight to reduce losses from mishaps.

This course presents our losses due to mishaps as the result of not properly attacking the Blue Threat. The Blue-Threat Concept now has been part of WTI training for two years. Many not so subtle indicators show the Blue-Threat concept is taking root in the minds of our finest Marine aviators and is expanding to other communities.

Perceiving the hazards we face everyday, in training and in our personal lives, as threats, Blue Threats, is the first step to changing the current, widely varied cultural perceptions of ORM. ORM is a tactic to prevent unnecessary losses in our force. We use this tactic because we understand the loss of one of our Sailors or Marines, whether to an enemy bullet or an automobile crash caused by extreme fatigue at the end of a long car trip, has the same impact on unit readiness and morale. It has the same impact on the family of that Sailor or Marine. The only difference is the nature of the threat that caused the loss; one threat is red, the other blue. One we may see a couple times in a career, the other we will face every single day. Tactics are needed to defeat both. ORM is a Blue-Threat tactic.

What Blue Threats do you face each day, whether flying, driving, working or playing? What are the risks posed by those threats? Will you accept those risks or reduce them by developing and executing sound tactics? Who will lead those tactics and watch for changes? Do these questions sound familiar? Seems a lot like identifying hazards, accessing hazards, making risk decisions, implementing controls, and supervising. Sounds a lot like ORM. Our best tactical minds now are engaged in our most desperate fight: To eliminate losses from the Blue Threats we face every day. Will you be part of that fight? Will you lead that fight?

Capt. Neubauer is the Head, Aviation Safety Programs, Naval Safety Center.

Execute the Plan

Since summer 2005, the MPR Force has reaped the benefits from reinstituting a back-to-the-basics campaign, which focuses on using naval-aviation fundamentals and the tenets of ORM to prevent mishaps.

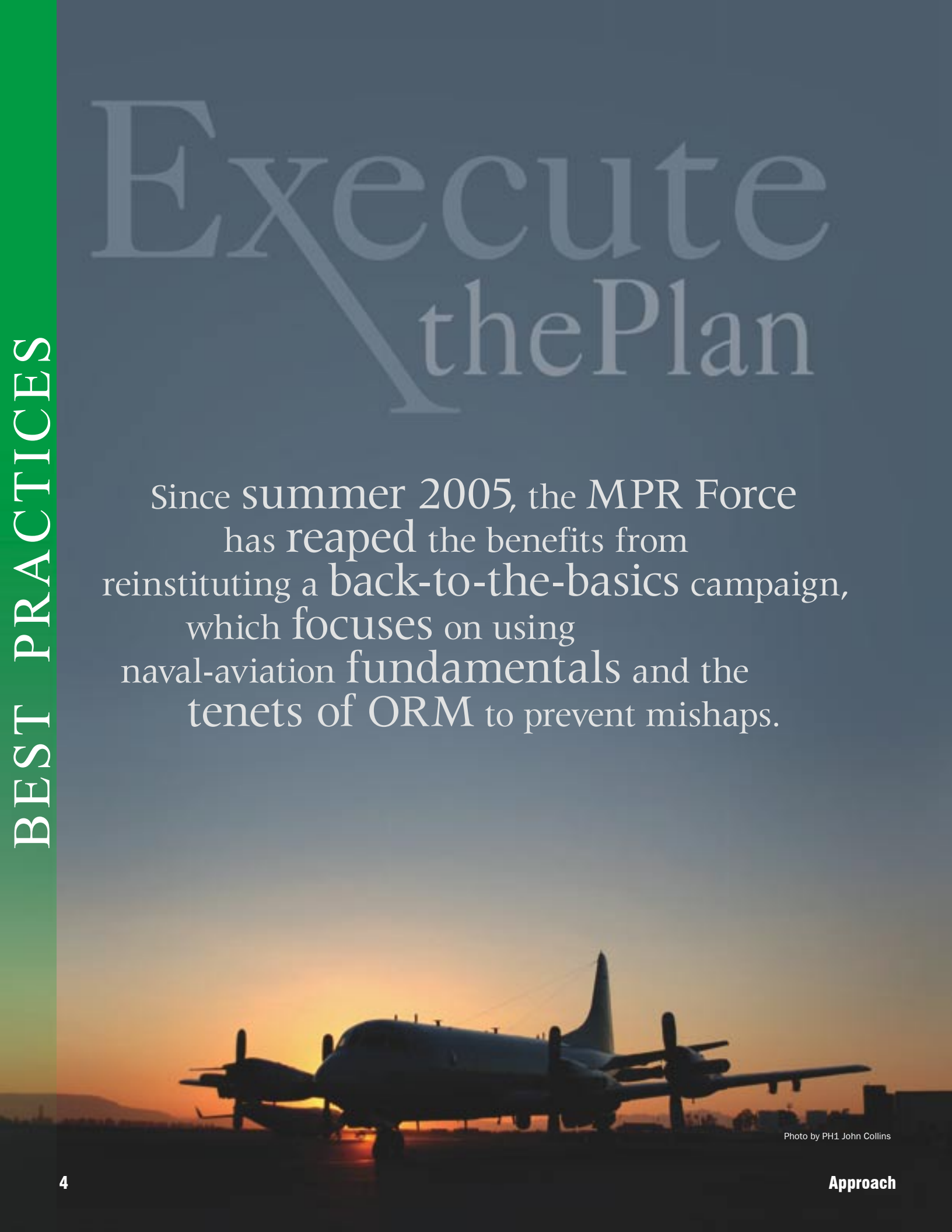


Photo by PH1 John Collins

By Cdr. Drew Kenny

The Maritime Patrol and Reconnaissance (MPR) Force is involved in an ongoing effort to reassess our vulnerabilities, identify risks, and implement controls to prevent mishaps. As this self-evaluation continues, we have identified two weak areas we must focus on and improve: using existing tools properly and fully exercising our collective responsibility to monitor and report violations.

Commander Patrol and Reconnaissance Group, RDML Brian Prindle, stated in a recent safety message that "following the plan the first time, every time, is our path to continued success, and will improve our safety culture across the force." Simply put, he said we need to "execute the plan."

Since summer 2005, the MPR force has reaped the benefits from reinstituting a back-to-the-basics campaign, which focuses on using naval-aviation fundamentals and the tenets of ORM to prevent mishaps. Despite these successes, the MPR Force has had their fair share of close calls, incidents resulting in a hazrep, and a Class C-flight mishap that involved an aircraft departing the runway during landing rollout. Well-instituted safety programs, emphasis from command leadership, open lines of communication, and safety stand-downs can help squadrons address hazards and mitigate risks, but real progress in safety and risk management comes from learning and energetically applying the lessons of failure.

Near-misses have been called the hidden seeds of the next disaster. The MPR Force is working to identify and eliminate all these hidden seeds, and we want to share three simple, proactive measures we're using with the MPR Force to prevent the next incident and properly execute the plan.

1. Increase reporting of miscues using hazreps.
2. Use more formal and rigorous aircrew-training-record reviews as a risk-management strategy.
3. Increase recognition and commendation of personnel executing procedures by the book.

These measures are positive actions to develop a more proactive, not reactive, safety culture. Just talking about one's safety culture will not develop what RDML Prindle has termed "a critical mass of proactive safety thinkers."

When everyone on our flight lines, hangar decks, aircraft, and those who plan the evolutions and look for ways to mitigate risks become proactive thinkers, then procedural non-compliance never will go unnoticed and never will fail to be corrected. Without a critical mass of people, we will continue to subject ourselves to the random mishap or hazard. The MPR Force knows these measures to improve our behavior will make us better. The effort we take now to eliminate causal factors to prevent mishaps and to avoid costly losses certainly will save time, pain, and money in the future. We want to reduce the need for less efficient reactions.

Our leadership believes there never has been a more important time in the community's history for increased focus on robust, proactive, communication-rich, and ORM-centric programs that emphasize the right balance between reporting our errors and upholding a high standard of personal accountability and responsibility. One such program is reporting our errors through hazreps, via the web-enabled safety system (WESS). Hazrep reporting across naval aviation has declined seriously over the past decade, and this also was true for the MPR Force. However, during FY06, MPR hazrep submissions dramatically increased. This increased reporting is a positive sign we are willing to openly communicate so others can benefit. We can avoid reoccurrences, and we proactively can address potential mishaps and their causal factors.

Near-misses have been called the hidden seeds of the next disaster.

Hazreps afford squadrons an opportunity to discuss pertinent issues and to offer feedback and suggestions on how to improve. Hazreps are used during hangar-flying training sessions by both experienced and inexperienced personnel to facilitate ORM and CRM discussions before being challenged with circumstances

similar to those where others have gone astray. Completing a hazrep reinforces that everything we do and say with respect to safety is vital. A hazrep also emphasizes individual accountability, so all hands clearly know what is expected of them. We never must waver in expectation or execution of the plan.

In addition to conventional hazreps via WESS, the MPR Force uses "visual hazreps," which are short PowerPoint presentations, using digital pictures to enhance retention of lessons learned from the hazrep incident. Visual hazreps are distributed across the MPR Force as incidents occur, and they also are discussed in working-group sessions and formal presentations during commander's conferences, operational-advisory groups (OAGs), and similar community forums.

As we follow through on our collective responsibility to monitor and report errors, we expand our awareness scan so human error doesn't go unnoticed. We have reassessed the effectiveness of our aircrew-training programs to make sure complacency hasn't set in to a point where we simply are going through the motions. Complacency easily can lead to overlooking an individual's negative tendency, which, if identified and remedied, can prevent a mishap.

Changes to the MPR Wing Training Manual have made sure careful, rigorous aircrew training-jacket reviews are conducted monthly and before qualification milestones. Such reviews lead to early identification of aircrew difficulties and negative trends, which then are discussed at monthly positional-instructor meetings (or potentially at human-factors boards). The appropriate level of the chain of command then can be proactive and make prudent use of resources for additional training or remediation as necessary. All training jackets must receive the same level of scrutiny, including those of individuals widely considered to be above-average performers. With thorough documentation of deficiencies, chain of command visibility, and permanent filing of critical information, we monitor trends and make sure we use our existing tools properly to execute the plan.

To go along with admitting our shortcomings, it is important to publicly recognize what we do right. Everyone in the MPR Force has a voice when it comes to safety issues. Active, all-hands involvement is required to eliminate the errors that lead to mishaps. As an aid to building the critical mass of safety thinkers, RDML Prindle recognizes individuals at the squadron level through Safety Pro Flag Letters of Commendation. At least one person in every squadron is recognized monthly. The abundant nominations are a great indicator the MPR Force is made up of confident, well-trained Sailors who know safety-related issues and are willing to point out unsafe practices, procedures, or environments. Safety pros take the lead to root out and eliminate non-compliance and serve as role models with an ongoing demonstration that commands truly are committed to developing a vibrant safety culture.

Everyone in the MPR Force has a voice when it comes to safety issues.

The measures detailed in this article were easy to implement, and they work. By employing basic risk-mitigation strategies and continuously emphasizing by-the-book execution of the plan, we have enhanced productivity and raised safety awareness. While we have made good progress developing and sustaining a critical mass of proactive safety thinkers, we still have more work to do.

For any measure to continually be successful, repetitive attention from the most junior Sailors to the highest levels of leadership is essential. The MPR Force is very aware that for each "hidden seed of the next disaster" we successfully eliminate, several more are waiting to grow. All hands must understand and embrace their responsibility to continually search for these seeds and, when found, take positive action.

Cdr. Kenny is the MPR Force safety officer, and flies as an instructor pilot with VP-30 based in NAS Jacksonville.

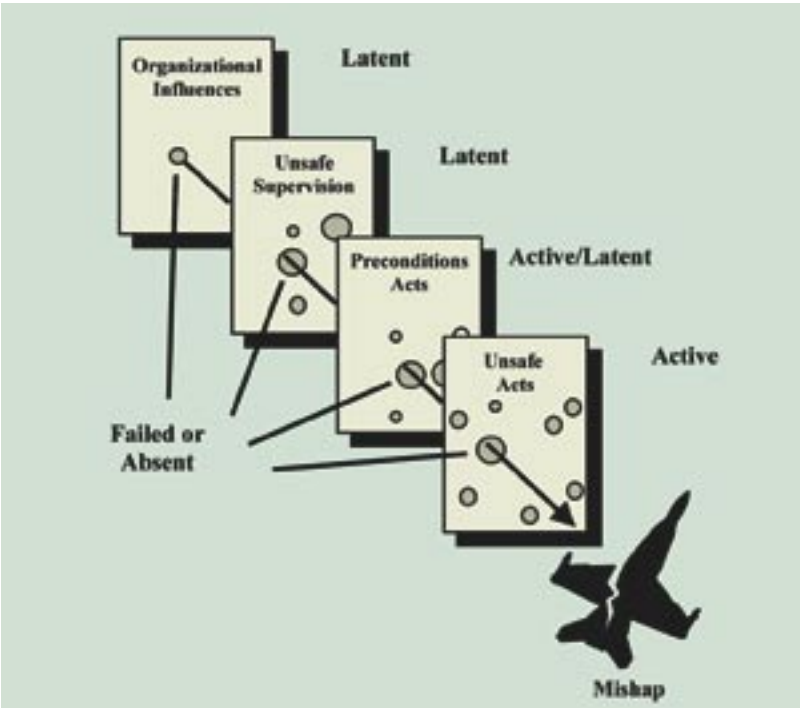
Unsafe Acts *in the* Hornet

By LCdr. Steve Kiggans

Despite intense proactive efforts, the Hornet community continues to struggle to make a significant dent in Class A-mishap rates. As we focus on the root causes of how aircrew have caused mishaps in the recent past, the analysis shows training and equipment upgrades can be improved to permanently reduce overall Hornet mishap rates.

Human-aircrew errors comprise 80 percent of all Hornet Class A mishaps. The Navy's Human Factors Analysis Classification System (HFACS) of accident causation defines the logical progression through which these errors can be traced and causal factors explained. The actual aircrew action that precedes the accident is known as an unsafe act, the final link in the chain. Aviation-mishap boards avoid labeling the unsafe act as the root cause of a mishap. Rather, they look holistically at the deep chain of events where all the holes line up in the Swiss cheese that led to the mishaps. The intent is to give a comprehensive picture of the myriad links in a chain of events. Though comprehensive and thorough, this approach can distract the force from seeing the most definitive events that led to the mishap. The purpose of this article is to be more direct in identifying the reasons why accidents happen in the Hornet community and to get to the root cause of mishaps.

To capture recent trends, Class A mishaps were researched using data from a six-year period, starting in FY2000. Of 65 mishaps, 52 were caused primarily by aircrew. This article attempts to distill each mishap to its primary causal factors by classifying each human-factors mishap strictly by the HFACS unsafe-acts definition of each category. Throughout the research, every effort was made to determine root causes by the aviators' action that led to each mishap. The results are not surprising: They offer a clear view of where the risk is greatest in strike-fighter aviation, and that the focus needs to be placed in the simulators, briefing spaces, ready rooms, and the leaders. By looking at the primary cause of accidents, training and aircraft systems can be optimized to protect our aircrew and aircraft while enhancing combat effectiveness.

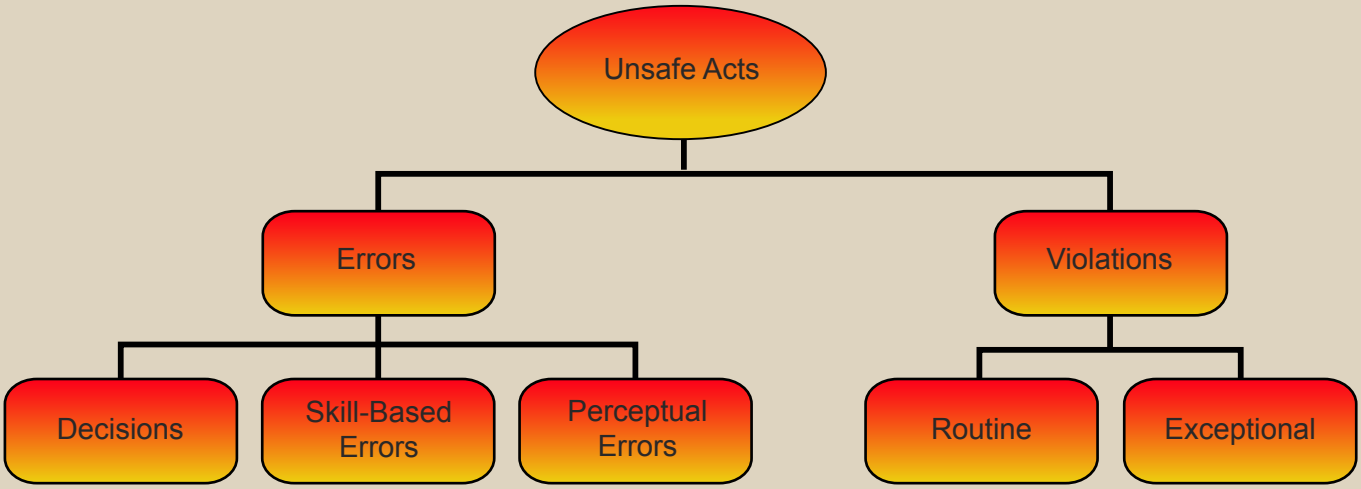


The Swiss Cheese Model

Human Factors Analysis and Classification System (HFACS)

Unsafe Acts

The two types of Hornet unsafe acts specified in HFACS are errors and violations. There are three main causes of errors: skill-based errors, decision errors, and perceptual errors. Violations of rules and regulations define a pilot's action or decision as a willful departure from authority.



Skill-Based Errors (SBE)

Skill-based errors were involved in 73 percent of the human-factors mishaps analyzed over the six-year period. Skill-based errors come from the basic operations of the aircraft: from control manipulation to normal and emergency-procedure execution. Basic skills are defined as all the normal abilities to safely fly your aircraft as a NATOPS-qualified aircrew. The most prevalent skill-based errors, along with the number of occurrences, are listed below:

- Inadequate collision-avoidance scan and procedures - 8
- Departure from controlled flight - 7
- Improper emergency-procedure execution - 5
- Poor CV/runway-environment scan - 3
- Improper power application - 3
- Improper normal-procedure execution - 3
- Inadequate terrain avoidance - 2
- Failure to monitor fuel consumption - 2
- Failure to maintain directional control on runway - 2

The hazard of out-of-control flight (OCF) has been significantly reduced by improved software. In the past, OCF mishaps regularly occurred, but since the flight-control-software change over three years ago, no Hornets have been lost because of OCF. The greatest risk for the community remains the midair-collision threat. Second to that, the proper execution of emergency procedures remains a serious deficiency. Runway accidents indicate a prominent skill deficiency throughout the community, clearly indicating a need for more effective training in admin basics.

Decision Errors

Decision errors are where a seemingly good decision goes bad, a poor decision is made, or where no proper decision takes place at all. These were cited in 37 percent of Hornet Class A mishaps. The most prevalent decision errors, along with the number of occurrences, are listed below:

- Failure to execute timely go-around on runway - 3
- Failure to choose and execute proper emergency procedures - 2
- Continued unstable approach - 2
- Continued below-minimum altitude - 2

Failure to analyze an emergency situation and conduct the proper procedure led to most decision errors. These errors mostly occurred following a brake or landing gear planning-system malfunction. The runway

continues to be where most bad decisions are being made by our pilots.

Perceptual Errors

Perceptual errors were involved in 22 percent of human-factor mishaps. These errors include misjudged distance, altitude or airspeed, as well as instances of spatial disorientation and visual illusions. The most prevalent of perceptual errors, along with the number of occurrences, are listed below:

- Spatial disorientation - 5
- Misperception of landing environment - 2
- Somatogravic illusion - 1

Spatial disorientation is dominant in this category because it is the leading factor that causes midairs and OCF occurrences. Visual misperceptions in the landing environment typically occur in night-carrier and reduced-visibility field operations. The risk of a somatogravic illusion induced controlled-flight-into-terrain (CFIT) remains during night-carrier operations; this problem is the perception of high pitch from acceleration off the catapult.

Violations

Violations were cited in 15 percent of the human factor Class A mishaps studied. Routine and exceptional violations remove established controls put in place to prevent aircrew errors. Although violations may be interpreted into the causal factors of many more mishaps, the eight mishaps noted below were the only ones that listed a violation as a causal factor.

- Standard operation procedure (SOP) violation - 3
- Breaking NATOPS limitations - 3
- Training-rules violation - 2

Other Human Factors in Mishaps

Physiological Factors

Physiological factors are most often a precondition for a mishap in HFACS; however, they realistically can be shown to be the root cause of many accidents. Gravity-induced loss of consciousness (GLOC) and hypoxia continue to kill Hornet pilots. Six Hornets were lost directly because of physiological factors: three to hypoxia, two to GLOC, and one with vertigo as a contributing cause.

Maintenance procedures

Of course, human-factor mishaps are not solely for aviators. The maintenance personnel have had their fair share of mistakes that have led to Class A mishaps. Eight maintenance human-error mishaps, 12 percent of the entire Class A group, were noted. The most prevalent type of human error continues to be "improperly following procedures." Also, two Hornets have been lost to human error by flight-deck personnel in a mishap involving an arresting-gear cross-deck pendant that parted.

How aircrew can prevent accidents

The path to human-error mishap reduction is clear: Training to the hazardous activities that have caused Class A mishaps in the recent past can reduce accidents. Skill-based errors, which overwhelmingly comprise the greatest number of unsafe acts, can be minimized by refocusing on emergency-procedure execution in the safest place they can be practiced: the simulator. The community must enhance frequent emergency-procedure (EP) simulators; the only time to practice handling the toughest situations shouldn't only be on an aviator's annual NATOPS check. Minimizing the risk of midair collisions should become the forefront of any ORM discussion in the flight brief, especially if the flight involves multiplane engagements and basic fighter maneuvering (BFM). Midair collisions are a hazard that must be accepted for mission success on most flights, but flight leads can shape training rules, mission scenarios, and designate reserved altitudes to manage risk.

Decision-making can be enhanced by a reinvigorated focus on NATOPS system knowledge and emergency-procedure (EP) execution. The best method for practicing decision-making and intense CRM is, again, through EP simulator events.

All aviators are susceptible to perceptual errors and physiological factors. With flight proficiency and knowledge of the hazards, the risks can be minimized. The Hornet community needs to continue to incorporate perceptual and physiological hazard discussion into the briefs of hazard-laden flights to make sure every attempt is made to minimize risk and train to the appropriate level.

Conclusion

A thorough understanding of the risks involved will allow Hornet aircrew to make tangible efforts to reduce mishaps. Training, planning, and open discussion of the hazards of midairs, runway emergencies, and disciplined basic-aircraft operations will reduce mishap rates and increase the effectiveness of the force.

LCdr. Kiggans flies with VFA-195.

When It Rains, I

By Lt. Jason Douthit

Shortly before my arrival at NAS Key West for shore duty as a station SAR pilot, I was told that the powers that be were sending me to school to become the base aviation-safety officer. "Cool," I thought, "a month-long vacation in Monterey. What a good deal."

I soon found myself in one of the most beautiful parts of the country, taking a very interesting course of instruction with a wonderful group of peers. I did well at the school, and before I knew it, I was driving cross-country to Key West with my diploma in hand and a whole lot of ideas in my head.

During the drive, I kept thinking back to one of the comments made by the CO of the school at graduation. He remarked that being an ASO was a lot like being in combat, minus the getting-shot-at part. He said, "It is long periods of utter boredom punctuated by moments of sheer terror." I was a little puzzled by his statement. How bad could it possibly get? After having the job for a year and a half, the CO's comment was lost in the back of my mind. Things were going well. Aside from the routine duties like safety standdowns and human-factors boards, very little had occurred. I only had to break out the 3750 once for an endorsement of a ground mishap that occurred with one of the dets. My replacement was in the pipeline with orders on the board, and in five or six months I'd be on to a new chapter in my career. This is when things changed for the worse.

It's no secret the Florida Keys are perilously exposed to hurricanes. The entire island chain sits a few feet above sea level and is surrounded by water. Since arriving for duty, I had seen six storms come close enough to Key West to make people sweat. We even evacuated for a couple of them, but in the end, the damage was superficial and things quickly returned to normal.

t Pours

Then hurricane Wilma formed in the Gulf of Mexico. Many of the sailors stationed at NAS Key West lost everything and returned to a life much different than it had been a few days earlier. The holidays were right around the corner, and the first holes in the infamous Swiss cheese model fell into line. Major, unforeseen stress had a foothold, and safety margins began to suffer. Families were uprooted and placed in tiny, cramped temporary quarters. Insurance and FEMA became part of everyday lives. Just providing the basics of food and a dry bed were serious hurdles. As I write this article, four months have passed since the storm, and most of the displaced Sailors still are not back in their homes. People had serious issues, and their attention spans were getting shorter and shorter.

Outside forces also were at work at the same time. Funding for shore installations was drastically cut in the past few fiscal years. NAS Key West felt the pinch, and in true navy fashion vowed to "do more with less." Air-traffic controllers, transient-line personnel, and qualified maintainers for the station's SAR helicopters were in short supply even before the storm hit. Already stretched thin, they were pushed to the breaking point after the storm.

The guys on the pointy end of the spear also were feeling pressure. NAS Key West opened for business about two and a half months after the hurricane, despite all of its problems. The Global War on Terrorism couldn't wait, and the pointy-nosed guys had only one place to go for ACM training on the east coast, as they worked up to their deployments. The "det mentality" became even worse than usual at the air station, as practices were observed that wouldn't even be imaginable back at the squadron's home bases or underway. Aircraft were being serviced and de-serviced with Gatorade bottles. Fire bottles with no charge were used

for launches and recoveries on the flight line. FOD discipline was unacceptable. Unfortunately, there were even fewer people around to police the detachments. Another couple of holes in the Swiss cheese model fell into line.

In spite of these factors, operations continued uneventfully at NAS Key West until one fateful day in February. It was a cruel twist of fate that I personally kicked it all off. The station's two H-60s had been down for a very long time and flight time seemed like a distant memory. When one of the birds finally came up, I got on the flight schedule and set out to get current in every area possible. One of these areas was confined-area landings (CAL). Even though I hadn't flown a CAL in many weeks, I picked a fairly challenging landing zone (LZ) and ended up dinging the tip caps on a couple of small branches. We didn't break threshold for a Class C, but I gave the flight doc some bodily fluids and swallowed a huge dose of personal pride. I broke out the 3750 again and started to write a hazrep. Even worse, we were back to having no up SAR birds. Getting replacement tip caps in Key West is significantly harder than getting them at North Island, Norfolk, or Jax. We were going to be down for a few days because of a stupid case of pilot error. Fortunately, we had responded to only one SAR since my arrival at the base, so I hoped we would be OK—I was dead wrong. All the holes in the block of cheese would fall into line that weekend.

The following Saturday, a detachment of Canadian CF-18s was flew in to begin training. Landing at dusk, the Hornets were directed to change runways while in the pattern. The new runway was 31, which has no PAPI lights and no OLS. The approach end of 31 is right on the water, with little overrun. To make a long story short, the lead Hornet did a little mangrove trimming (literally), and took a good portion of the airfield's fence (which had just been repaired after Hurricane Wilma) with it. How that plane didn't end up a smoking hole is beyond me. As it turned out, he dinged his gear and his flap, and the Canadian flight-safety officer had a mishap investigation on his hands. They don't teach you how to coordinate with foreign countries in ASO School. Fortunately, the Canadian FSO was very helpful, and I am waiting on their equivalent of an SIR to do yet another hazrep. This mishap was to be only the tip of the iceberg.

Photo Composite.

A bad week was getting worse, and there was more to come. The Monday following the Canadian incident it was unseasonably cool in the Keys—perfect weather for the formation of sonic booms. A reserve Hornet broke the sound barrier returning from one of the local working areas, and rattled more than a few windows

in Key West. Although the FA-18 was far away from the island chain and broke no written rules, the sonic-boom-propagation conditions were just a little too good that day. We're still sorting out the fallout from that incident, and potential claims against the government. More importantly, there was a sonic-boom advisory issued for NAS Key West, but no one in the squadron was aware of it. In fact, the pilot had no idea the METOC folks even produced such a product for flight planning. But, there would be more on my plate. A Hornet crashed into the water three days later. Having no up SAR birds, we were unable to launch. Fortunately, a Coast Guard boat picked up the pilot, and he was not hurt that badly.

The weekend finally arrived, and everyone hoped that the following week would see operations return to normal. Unfortunately, things went from bad to worse. The following Tuesday we had an incident of controller error that resulted in a near miss on the runway between a P-3 and a T-34. The T-34 was shooting a TACAN to runway 7 just ahead of the P-3, which was shooting a PAR to runway 3. After landing and rolling out, the T-34 was cleared and turned off at midfield, crossing runway 7 in front of the P-3 as it crossed the threshold to do a touch-and-go. The resulting waveoff resulted in the P-3 overflying the T-34, low enough to get everyone's attention. As a result of this near miss, the ATC officer and I spent the better part of a week figuring out how to do an ATC hazrep on the new web-enabled-safety system (WESS).

Finally, to top it all off, a Marine Corps Hornet was lost the following Tuesday. This time, our SAR helo was able to pick up the pilot. Thankfully, he was OK. As you can imagine, the base CO's tolerance was maxed out. He ordered a safety standdown for the entire air station, including all detachments, to discuss the events of the preceding week and a half—there was a lot to talk about.

OK, let's recap. In two and a half weeks, we had a helo trim a pine tree, put two Hornets into the water, barely avoided making a smoking hole out of a third Hornet, rattled the windows of the entire island, and narrowly dodged a runway collision. What in the world was going on at NAS Key West? We had a little of everything in the mix: rotary-wing, TacAir, foreign-military forces, TraCom, ATC, MarPat, USN and USMC aircraft, and active and reserve units.

What was making everything come to a point in such a short period of time? It wasn't just Key West that was having a tough time. In the preceding couple of weeks, the Navy had lost a T-34, a T-39, another Hornet, an SH-60B, and two H-53s. The CNO's goal of reducing mishaps by 50 percent was taking a major hit. As expected, many factors were at play. Stress from the hurricane recovery affected everyone at NAS Key West. With many Sailors still displaced and living in cramped temporary quarters, tempers were flaring, sleep patterns have been disrupted, and it has become difficult to focus at times.

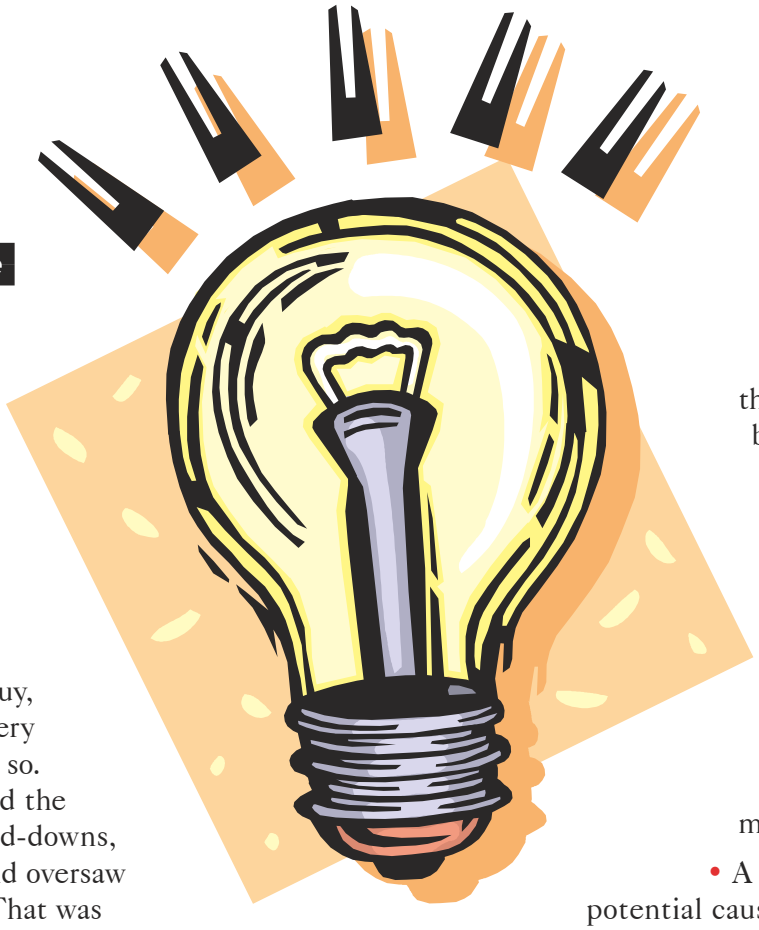
The visiting squadrons also have been adversely affected. They are packed into the VQ like sardines, and many of the Key West liberty opportunities are not available to help them decompress after a stressful day of flying. The result is that the edge so necessary to operate naval aircraft has been dulled. Add to this the pressures of completing the required workups in the interdeployment training cycle (IDTC) and getting back to the front of the Global War on Terrorism. These pressures can often compromise safety if leadership is not constantly on guard. The fiscal restrictions placed on the entire Navy, particularly shore installations, in this era of shrinking budgets and privatization, may also have eroded safety margins as personnel have been reduced, and we've all been stretched thinner and thinner.

I revert to the CO's comments at ASO school. We definitely had a couple of weeks of sheer terror. I'm just glad no one seriously was hurt or killed. The lesson to take from all of this is that everyone, but especially leadership at all levels, has to stay sharp and focused at all times. As my XO is fond of saying, "Everyone is the safety officer."

At safety standdowns, I always tell the Sailors that naval aviation is not an inherently dangerous profession, but it is inherently unforgiving. Small errors can lead to not-so-small consequences. We have excellent procedures and safety programs to help prevent mishaps, but they are only as good as the people implementing them. Someone—no, make that everyone-has to be alert for the small deviations that can build into mishaps. In the modern Navy, safety is primarily a human-factors issue. That is as true at the macro NAS level as it is inside the cockpit. The recent events at NAS Key West and throughout the fleet make that statement abundantly clear.

Lt. Douthit flies with NAS Key West.

The Bigger Picture



By Lt. Connor S. McLemore

By the end of my first sea tour, I thought I had a good idea of how the Navy safety program worked, as well as where I fit into it. I certainly knew what our squadron safety department did. I wasn't a safety guy, but I knew their work was very important—the skipper said so.

The safety folks updated the read board, gave safety stand-downs, held my NATOPS jacket, and oversaw training before unit evals. That was about the extent of my safety knowledge. I was confident I was doing my part, and the safety folks had the rest covered. After all, I knew I safely operated within the rules set forth by higher authority. I even had bought into the concept that safety was everyone's job, even mine.

I did my best to be an active participant in the squadron's safety program. Unfortunately, at the same time, I was failing in my responsibilities to the Naval Aviation Safety Program (OpNavInst 3750.6R): I was unaware I had specific responsibilities under the safety program.

The list below identifies the minimum knowledge I believe everyone involved in naval aviation should have to be an effective participant in the naval aviation safety program.

- The goal of the program is to identify and eliminate hazards before they result in mishaps.
- A hazard is defined as a potential cause of damage and injury under human control.
- There are three situations you are required to report to your squadron safety department:

1. Whenever less than mishap-reportable loss occurred. (This means whenever something breaks on the aircraft, you are required to inform your safety department.)
2. Whenever a hazard is detected or observed.
3. Whenever an event occurs that should have been a mishap, but for luck, quick reaction, or procedure.

- The formal hazard-reporting process of the program is ideally initiated when you report any of the

above three situations to your safety department. Less ideally, the formal-reporting process is initiated if you are involved in a mishap.

• You shouldn't be assigned tasking from your safety department for reporting a hazard. In fact, your squadron safety department is required to encourage and reward hazard reporting.

• Nothing needs to break, and no near-mishap needs to occur for a hazard to exist. In the E-2 community, the radar altimeter is an example of a hazard that goes unreported. Despite the radalt being a system that rarely malfunctions, it is a fleet, top-10 safety concern because of its poor positioning in the cockpit, its blinding light at night, and its lack of an aural tone. Reporting the hazards of the radalt to the safety department should be initiated in the ready room, when you and the bubbas are talking about how much the radalt sucks and how it blinded you during that night Case III.

• If you have a safety concern you think everyone already knows about, ask your safety department to see recent related hazard reports. If no hazard report exists, you can assume no fix is in work.

• The naval aviation safety program eliminates hazards in the fleet by getting systems fixed and publications changed. The program works only when everyone in the squadron is involved.

• Your skipper is the top safety officer in your squadron. If you have serious concerns or questions your safety department just can't seem to handle, go see the skipper and let him know what's on your mind. He has the experience and authority to determine the best way to deal with the issue.

Since becoming wing safety officer, I have learned the purpose and importance of the naval aviation safety program. The program is not just for safety officers, it requires all naval-aviation personnel to familiarize themselves with its contents. I believe this requirement exists because the program will not work without active participation from all squadron members. If you don't know what you are required to report to your safety department, they won't be aware of the hazards you know about. Those hazards then could go uncorrected, not just in your squadron, but also in other squadrons and throughout the fleet. Maybe someone else will report the hazard, or maybe it will result in a costly and unnecessary mishap. It really is up to you.

Lt. McLemore is with ComACCLogWing.

My hat is off to Lt. McLemore. He has it right. We would much rather use the OpNavInst 3750.6R, Naval Aviation Safety Program, for preventative purposes than to get familiar with the instruction after we have sustained a mishap. The 3750 is, after all, just a bunch of words on paper, it only becomes a working program when aviators, Sailors and Marines heed those words.

The 3750 was first written in the 1950s and we are working on the 3750.6S revision. If you have suggestions, please pass them to your controlling custodian (TYCOM) safety officer. Thanks again.—Kimball Thompson, EA Aviation Safety Programs, Naval Safety Center (The 3750 guy)

Mishap-Free Milestones

VAW-125	38 years	73,251.6 hours
VAW-123	38 years	72,000 hours
VP-9	28 years	170,000 hours
VP-8	28 years	168,000 hours
VFA-143	17 years	55,316.9 hours
HS-5	10 years	32,513 hours
VQ-2	9 years	45,000 hours

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

First Typical Day

By AW2 Ian Fralic

The brief was typical.
My flight gear check-out was typical.
Even the walk to the aircraft was typical.

I remember having to shut down for a loose latch on a cowling—a relatively common occurrence. The flight was shaping up to be an average, everyday, mine-countermeasures training mission.

I was scheduled to get safety-observer training from a senior aircrewman. I had flown with the entire aircrew many times before and nothing had been out of the ordinary. I knew the mission commander quite well; we checked in to the squadron around the same time and had been on many detachments together. Although I never had flown with the copilot before, I didn't doubt his abilities. After our 150-foot power check, we began to stream our mine-countermeasures sonar (AN/AQS-24, or Q-24, for short). The two aircrewmen on the ramp were experienced with the Q-24 and no one expected any problems.

Then the crew chief heard an unusual sound. Once he mentioned it, I noticed it as well. I placed my hand on the bulkhead and felt a vibration. We asked the pilots to check their gauges, and they said everything looked normal. Meanwhile, the sound got louder. The console operator, another senior aircrewman, got up and stood between me and the crew chief. As

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AW2 Fralic is reenlisted by his cousin, LCdr. Chip Brown, USN (Ret.), a helo pilot and a former Naval Safety Center flight-data-recorder analyst, next to the salvaged aircraft.

he keyed his ICS and said, "It sounds like the main gear box," the pilots heard the noise through his transmission. We decided to return to base to troubleshoot.

As we prepared the cabin for a possible emergency landing, the crew chief got into the jump seat to assist the pilots. The noise got louder as the pilots began to declare an emergency. A main-transmission chip light and a first-stage, main-rotor bypass light illuminated on the caution panel.

"Ditch, ditch, ditch," is all I heard next.

"Mayday, Mayday. This is Vulcan 560. We're going down 30 miles off the coast of Oceana, Virginia." Those were the last words I remember hearing over the radios.

We waited for the rough landing that was expected. I remember looking at the hellhole and seeing salt spray bubble up through the sides of it. Then I heard "Pop," followed by dead silence. The noise was gone. I looked back and watched as water rushed in, cascading over the single winch. I looked forward and saw the crew chief open the upper half of the personnel door.

He turned aft and yelled, "Stay calm."

"Fine by me," I thought, "I'm going over to get the raft."

As the water reached our waist, the crew chief and I staged the life raft on the lower half of the personnel door. The rotor head still was spinning but slowing down. We saw the two aircrewmen on the ramp outside in the water; they still were close to the aircraft. We yelled for them to come closer so the rotor blades wouldn't injure them. When the rotor head stopped, we began to exit the aircraft. As I was halfway out, the helicopter began a slow roll to the left side. The inrushing water pushed me out the rest of the way.

As soon as I realized I was free of the aircraft, I inflated my life-preserver lobes and turned toward the raft. The crew chief already had deployed the raft, so we began helping one another in. The cold water really took a toll as I got onto the ramp; I could see my hands gripping the raft, but I couldn't feel them. With some brotherly assistance, we all got into the raft and made contact with a Coast Guard C-130, who began to circle overhead like a vulture.

We cracked jokes as we waited for SAR to pick us up. One guy spotted the mission commander's lunch box floating in the water and offered to retrieve it, but he said, "Don't bother. The sandwich will be soggy." I said, "Hey, at least we get all new flight gear." Another aircrewman said, "Next time, I'll put my cigarettes in a plastic bag; now I can't relax until I get home."

After a brief stop at USS *Bataan* (LHD-5), the HSC-26 helicopter dropped four of us off at Portsmouth Naval Hospital; the other four were picked up in an HSC-28 helicopter. We were released to go home a few hours later.

Excellent crew-resource management and proper execution of our survival skills helped us make it out alive with only minor injuries. Periodic survival training is there for a reason; make the most of it. You never know when you'll need it on a typical day.

AW2 Fralic flies with HM-14.

One Minute Saved My Life

By LCdr. Dave Vodicka

As a squadron safety officer, it is my responsibility to be the CO's conscience on safety matters, promote safety programs, provide training, and get the masses excited about safety as a way of life.

At Aviation Safety Officer School in Pensacola, ORM (operational risk management, as if I need to spell out the acronym because we've heard it so many times), is crammed down our throats ad nauseam. As a result, ASO graduates are ORM instructors by trade. I knew I would have a tough job teaching ORM because, when someone starts talking about it, most people tend to turn off like a switch. I wanted to make ORM easy to understand, so I kept coming back to a personal experience I had several years ago. Let me relate a story and the reason I am alive today.

In 1998, I was halfway through my first tour as an SH-60B pilot with HSL-37, and I had been a helicopter-aircraft commander (HAC) for about a year. I remember my skipper had asked me during my HAC board to list the five ORM steps. Back then, ORM felt like it wasn't much more than a harassment question on a test.

One night on my second deployment, my crew was scheduled for a typical SSC mission in the North Arabian Gulf (NAG) with USS *Crommelin* (FFG-37). The summer was hot and miserable, even in the evening after the sun had gone down. We briefed, completed the preflight inspection and manned up—nothing out of the ordinary. My 2P was a lieutenant (junior grade) on his first cruise, and my crewman was a young, well-respected AW2 that I had flown with many times before, including our previous deployment a year earlier.

We started engines and engaged the rotor system. The only noteworthy comment about the event thus far was that it was a moonless night (go figure), and the flight deck was exceptionally dark. A newly trained chock-and-chain crew was assigned for flight quarters. We finished the checklists and signaled for chocks and chains to be removed. We saw the two personnel enter the rotor arc. As we watched and waited for the chains to be removed, the three of us in the helicopter commented about how long it was taking for the main-mount-wheel chains to be removed. But, because the personnel were new, and it was very dark, they must have been having difficulties removing the chains. After several more minutes, they finished the job, exited the rotor arc, held up the chains, and dropped the chocks so we could see they had removed everything. I made a mental note all four chains were accounted for and that the helicopter was clear.

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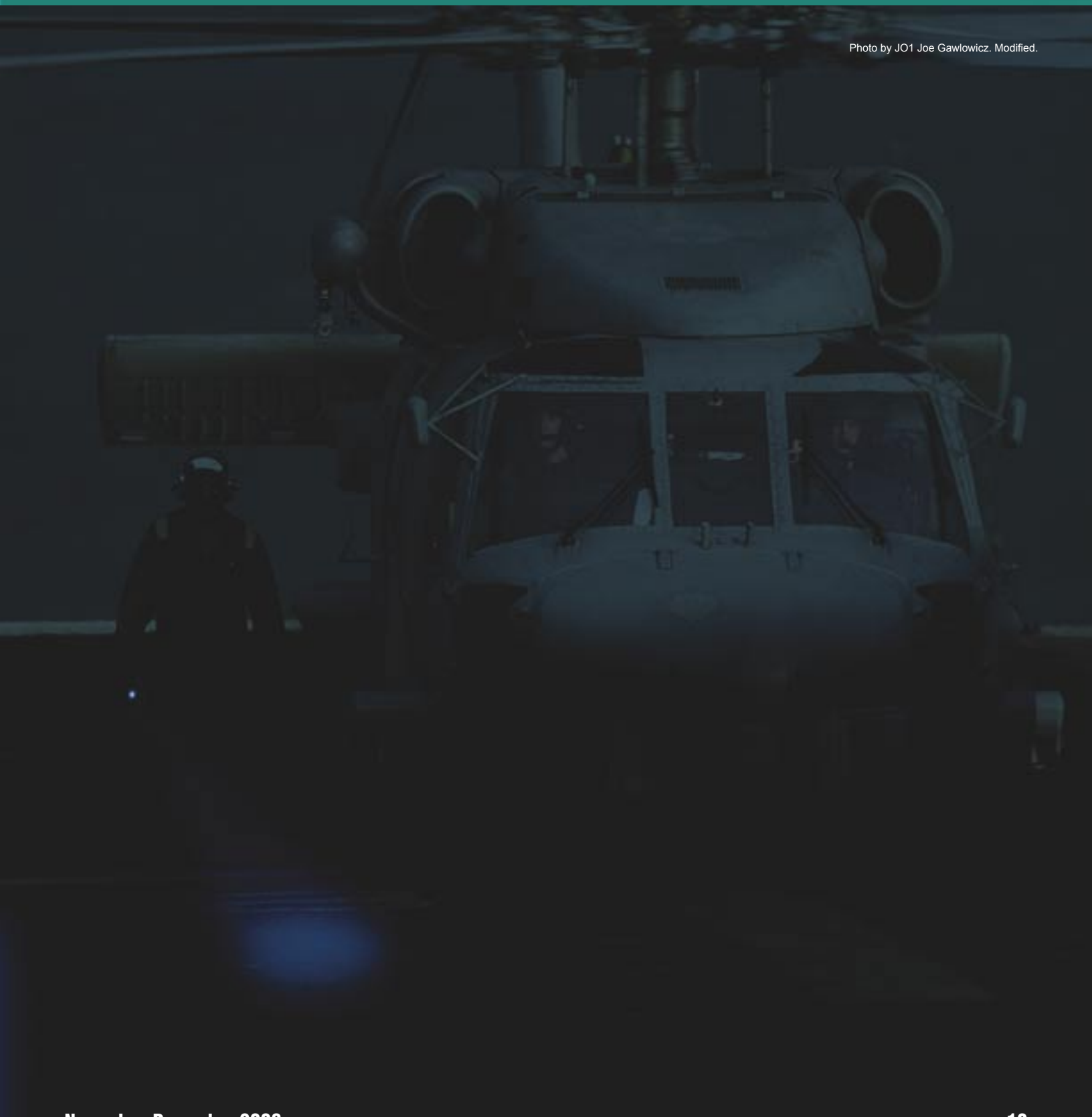


Photo by JO1 Joe Gawlowicz. Modified.

We were ready to launch. A quick scan of the instruments indicated everything was normal. My crewman then said he felt a little uneasy about how long it had taken to remove the chains and said he wanted to step outside to do a quick visual sweep of the helicopter to make sure everything was clear—good on him. I supported his suggestion. There was no rush, and we called paddles to let him know it would be just another minute or so before we were ready to lift. This minute ultimately saved our lives.

We later learned the aircraft maintainer on our det, who performed the task, had serious personal issues.

By now, you might be thinking you've got it figured out: The crewman found a chain still attached, and we prevented the catastrophe of trying to take off while still tethered to the deck of the ship—wrong. By taking a few seconds to look at the situation, unstrap, unplug his ICS cord, open the cabin door, and get one last look at the helicopter, he unknowingly performed an ORM process. From the right seat, my 2P watched him check the right mainmount and right side of the helicopter. Then, from the left seat, I watched him as he walked around the front and to the left with his flashlight. He checked the left mainmount, took a few more steps aft, paused, then scurried around the front again, came through the cabin door, quickly hooked up to the ICS, and called for an immediate shutdown. Just as he did this, I saw the main transmission-pressure-tape gauge drop from green (normal) to yellow (caution) to red (critical). We grabbed the PCLs, shut down the engines, and stopped the rotor blades with the rotor brake. The aircraft obviously was down—end of night. I didn't think much more about what had happened until much later.

What my crewman had seen was transmission oil pouring down the left side of the aircraft. The chock and chain personnel did not notice it because it was dark, and they were new. They probably didn't have enough situational awareness (SA) to look beyond the chains. We also learned maintenance had been performed on the rotor head that day, requiring a disconnect and a reconnect of a transmission line. In reconnecting the line, the maintenance person only had hand-tightened it. To make matters worse, QA missed the fact the line was not tightened per the maintenance-instruction manual (MIM). We later learned the aircraft maintainer on our det, who performed the task, had serious personal issues.

I can't help but think what could have happened if my crewman had not taken that one extra minute to voice his concern and take one last look. We would have been cleared to lift, pulled into a hover, backed away from the flight deck, made the pedal turn, and climbed into the darkness. I surmise that passing through 500 feet AGL, we would have seen the indications on the gauges for a failing transmission from lack of oil. There would have been nothing we could do but pray it didn't seize before we could land on the boat. Considering we had a moonless night, we were operating from the boat in the NAG, with no diverts, and we had a failing main transmission. I doubt we would have survived the fall and subsequent crash into the ocean.

Whether we realize it or not, 90 percent of ORM is on-the-run or time-critical; we do it without thinking about it. It's about asking yourself, "What can hurt me?" and "What can I do to prevent it?" The process is that simple, and that is the message I want to get to the deckplates. Can you see the connection to my story? My crewman saw the chock and chain crew having difficulties and felt uncomfortable about it (What can hurt me? *Identify and Assess the Hazards*). Then he voiced his opinion, unstrapped, unhooked, and performed one last walk-around (What can I do to prevent it? *Make Risk Decisions and Implement Controls*).

Last, he called for an immediate shutdown (*Supervise*). It is ironic that he didn't find what we all had expected him to find on his walk-around: an attached chain. Nevertheless, ORM also is about doing the right thing. He did the right thing. It would have been so easy just to have trusted what we saw: all chocks and chains accounted for and green gauges.

Admittedly, when I recently asked him about that night, he said he really never realized how important his decisions were, nor did he realize it was ORM. That's OK, because I do, and I'm alive today to tell the story, and to teach ORM in a way we all can understand and relate to. Thanks again, Emile, for saving our lives that night.

LCdr. Vodicka now flies with VR-58, and Ens. Emile Therrien is an advanced helicopter student at South Whiting Field.

Fumes in the Cockpit

By Lt. Ken Berger II

I was fresh out of the fleet replacement squadron (FRS), 90 hours in type, flying a front-seat event with my first fleet squadron. The flight was an out-and-in to NAS Fallon—simple enough for an airnav flight. Everything went as planned en route to Fallon. The fun didn't start until the return trip to NAS Whidbey Island.

We taxied onto the runway, did our takeoff checklist, and began to run-up the engines. After 1,000 feet of takeoff roll, all four crew members simultaneously announced over the ICS that our eyes were burning. The verdict was unanimous: We had fumes in the cockpit. I quickly executed the smoke and fumes boldfaced procedures, only to discover the fumes still remained as we taxied clear of the active runway.

The mission commander and pilot decided we would assist maintenance by troubleshooting the problem. We sat in our line for a couple of minutes after passing the hot-brakes inspection, and after trying to isolate the problem by running up the engines. The fuel-exhaust fumes did not dissipate at all during the five to 10 minutes we were parked in the line. We then decided to taxi to the alpha taxi and run-up area to troubleshoot further. We still were unable to isolate the fumes in the cockpit after running the engines for several more minutes at a higher rpm.

One thing was for sure: We did notice a stronger fuel-exhaust smell with the engines at the higher rpm setting. The smell of unburned fuel permeated our entire cockpit. Being responsible aviators, we kept the front canopy cracked and also made sure our oxygen masks were on to keep the exhaust-fume inhalation to a minimum.

After running up the engines numerous times without being able to isolate the fumes, we taxied back to the line. (Of note, the Prowler brakes may continue to heat up for two to 10 minutes before reaching their maximum temperature.) Pulling into the hot-brake area proved to be interesting. When we stopped for a hot-brake inspection, we were told we had hot brakes. We also realized the hot brakes on our port mainmount had caused the wheel-tire fuse plug to blow. The airfield's fire trucks and crash crew had been dispatched for our safety. We sat with fumes in the cockpit, hot brakes and a deflated tire—the hits just kept coming. While we waited, we encountered our third emergency of the day.

Our constant-speed-drive (CSD) light illuminated on our caution-lights panel, indicating our CSD had reached a temperature of at least 260 degrees. We now were in a dilemma; our CSD needed to be shut down before it uncoupled. One small problem, though: We needed someone to catch the fuel from our port motor's primary manifold. Catching the fuel would keep any of the hot fuel from pouring down onto the hot brakes, potentially igniting the fuel.

The crash crew would not let anyone get near the jet because of our brakes. After much heated debate with the crash crew over the temperature of our brakes, we finally got someone to inspect them, which allowed one of our line personnel to catch the fuel. This move also let us shut down the overheated CSD.

Multiple emergencies are a reality. You never can be too sure how many emergency procedures you may encounter at any moment. You constantly should review boldfaced procedures that one day will save your life.

Looking back on our situation, we should have allowed maintenance to troubleshoot the problem once we had pulled into the line the first time. Allowing maintenance to get the job done would have saved us a deflated tire and the hot brakes. Our maintenance department also would have found the port fuel-heat exchanger had blown apart at the seam, which allowed unburned fuel to enter the environmental-control system.

Lt. Berger flies with VAQ-141.

Enter the Process

By LCdr. Gabe Soltero

Picture this: three carriers and 18 aircraft from three different services, all flying in close formation for the money shot. Then add foreign naval officers observing the show from the flag bridge. Oh yeah, this event was happening three weeks before the end of a six-month deployment. Can you say "ORM nightmare"?

Should I ask those famous last words, "What possibly could go wrong?"

I can see the origins of this whole event: Late last year, some commander sitting at a desk in cubicle-world must have looked at the overlapping schedules of the three aircraft carriers and wondered how to get them together for some good, old-fashioned, blue-water ops. Ten months, 36 briefs, and 2,874 slides later, the stage was set. But the exercise—the first of its kind—was missing a name. Never ones to let creativity get in the way of the pedestrian, planners chose (yawn) *Valiant Shield*. But, wait, staffers wondered, "What about a picture?" After all, it's not every day you get a B-2 to fly low over a dozen ships, leading a formation of multiple tactical and rotary-wing aircraft from three services. Wouldn't the boss just *love* such a picture? Wouldn't the pilots in the formation get a huge kick out of saying, "Yep, that's me right there"? Enter the ORM process.

You can imagine the first step in this entire ORM analysis, where you identify the hazards, must have taken quite a while. Everything from weather and sea state to broken aircraft and wayward merchants who might disrupt the painstakingly choreographed formation were identified. Then we factored in the Air Force and its, well, Air Forceness.

Seriously, though, one of the more dangerous hazards we considered was focus. Our carrier was on the way home after its air wing had spent three months patrolling the skies over Iraq and helping out the troops on the ground from Basrah to Mosul. The missions were intense at times, and we departed the Gulf after doing what we believed was a fine job. Now our mindsets were shifting to homecoming mode. True, we are professional aviators, paid to put aside our personal worries, use CRM, and do our job well. But, we're also human, and to think we simply can forget we'll be home in a little more than two weeks is unrealistic, if not foolish. As real as this hazard was, it was a simple one to mitigate: No fixed-wing aircraft from our strike group took part in it.

The planning stages proceeded smoothly as the ORM process continued. When all was said and done, there weren't many differences between the photo-ex brief and the type of brief we conduct before flying on a daily basis: fallout plans, go-no go weather, altitude

Photo by PH3 Jarod Hodge. Modified.

deconfliction, and SAR assets. Sometimes it takes doing something out of the ordinary for one to remember we employ ORM on every mission.

When the day of the event arrived, the gods were kind, granting good weather for us to show our stuff. In a move that certainly surprised more than a few people, naval officers from a foreign country came aboard our carrier to observe the entire evolution. Some might perceive this move as yet another hazard, and they might be right. It certainly was not necessary to add any more pressure—real or perceived—to what already was a risky evolution. Again, the solution was a simple one: All the participating aircraft were from units and/or ships other than the one the foreigners were visiting. We knew we could put on an impressive show, but we also were convinced we could do so without being too flashy. ORM helped us not forget that bit of common sense.

The carriers lined up three abreast, with the cruisers and destroyers bringing up the rear. Sailors hoisted battle ensigns as their captains looked on proudly. Helicopters darted here and there like movie directors on a set, urging this carrier to increase her speed and that destroyer to come left half a degree. Soon enough, everyone was where they needed to be; it was time.

The B-2 led the flight of 17 (plus one chase plane), sweeping over the ships and perfectly casting its shadow over the carrier at the very center of the formation. On each of its wings, a division of FA-18s, one Navy, one Marine, followed in diamond formation, with Air Force F-15s and F-16s in a second echelon behind them. It was a beautiful sight.

Aboard the various vessels, camera flashes went off as they do at the Super Bowl's opening kickoff. The jets circled and returned to their rendezvous point before making a second pass. All went smoothly, or at least it seemed so to this observer. More pictures were snapped, and the planes returned to their launching point. ORM had paid off, and the results immediately were evident: a pumped-up crew ready to begin a large exercise, an impressive show of air and sea power for our foreign visitors, and a vote of confidence for joint operations over the open ocean—not too shabby.

While we may not always have the luxury to perform an in-depth ORM analysis for all we do, we certainly can use the basic tools of the process to become aware of what might hurt us when we're not looking. That's where the two other levels of ORM, time critical and deliberate, come into play. In the end, if we all get to go home safely, we've done our job. Our responsibility as leaders is to continually instill this process in our culture; it's designed for use with special events, as well as daily activities.

LCdr. Soltero flies with HS-4.

BRAVO Zulu

The crew of Venom 513, Lt. Albert Zangrilli (HAC), Lt. Mike King (H2P), and AW1 Robert Bautista (SO), were conducting search-and-rescue training in the Indian Ocean. While established in a Doppler hover, the aircraft started to exhibit a one-per-revolution vertical vibration. As the vibration gradually increased in severity, the crew accurately diagnosed the main-rotor-damper failure and manually departed the hover. The crew executed the NATOPS procedures, called emergency flight quarters, and landed their SH-60B without incident on board USS *Leyte Gulf* (CG-55). The entire ship-air team is to be commended for their quick reactions in setting emergency flight quarters and flawlessly recovering their helicopter.

(From left) Lt. Mike King, AW1 (AW) Robert Bautista, and Lt. Albert Zangrilli.

During a Case III recovery to USS *Ronald Reagan* (CVN-76), aircraft 501 experienced severe nose-down pitch at low altitude. Lt. Matthew Maher completed the immediate-action procedures for uncommanded flight-control inputs and climbed to a safe altitude. Lt. Brien Croteau coordinated their situation with the ship. While Lts. Maher and Croteau worked through the applicable checklists, Lt. Marie Wise and LCdr. Christopher Bergen got bingo-fuel numbers for multiple configurations to NAS North Island. Despite all efforts, the aircraft's pitch trim was frozen at full nose-down. After testing the controllability of the aircraft during three approaches and maintaining full back-stick pressure, the crew flew an emergency divert to NAS North Island. Postflight analysis revealed a failed horizontal stab-trim actuator.

(From left) LCdr. Christopher Bergen, Lt. Matthew Maher, Lt. Marie Wise, Lt. Brien Croteau.

(From left) GySgt. Tom Burkhardt, 1stLt. Paige Payne, Capt. Dan Groeling, Sgt. Josh Gilbow and LCpl. Bart Davis.

During a January night flight, Capt. Dan Groeling, 1stLt. Paige Payne, GySgt. Tom Burkhardt, Sgt. Josh Gilbow and LCpl. Bart Davis, were flying a UH-1N in support of a convoy-escort mission in the Al Anbar Province of Iraq. Toward the completion of their uneventful escort mission, Capt. Groeling's crew in the Dash-2 position declared joker fuel with 450 pounds of fuel indicated, which alerted the lead AH-1W of their impending bingo-fuel state. Noting a squall line forming between the section's current position and Al Taqaddum Airbase, the crew adjusted their bingo fuel for a little extra time aloft if needed to circumnavigate the weather.

With about 425 pounds indicated, they received a caution-advisory light, meaning the right fuel-boost pump had failed. Capt. Groeling advised lead aircraft of the emergency and headed toward the airfield. Lead advised the convoy commander of the situation, made one more reconnaissance pass, and continued to join the Huey. About two minutes after receiving the caution light, the crew received a fuel-low caution light. According to NATOPS, after a boost-pump failure, any secondary fuel-system malfunction made this a land-as-soon-as-possible emergency.

Confusion set in among the crew because 400 pounds of fuel still were indicated, and the UH-1N NATOPS states the fuel-low light is not supposed to illuminate until 100 to 300 pounds are indicated. The crew immediately noted the time.

Capt. Groeling had remembered a maintenance-action form in the ADB that warned the next pilot to verify the low-fuel-light functionality, because, on a previous ground-turn test, the light had not come on until 20 pounds were indicated. With many confusing and conflicting indications, the crew assumed the float switch that gave the fuel-low light was malfunctioning, and they continued flight.

To avoid the city of Ramadi, the crew skirted along the shoreline of a large lake south of the hostile city for the 15-mile flight to the airfield. Because of the situation, the flight accepted a seven-knot tail wind for a straight-in to the approach end of runway 12L. After falling in trail of the lead AH-1W on short final, Capt. Groeling began the landing transition at 100 feet. But, a left boost-pump-caution light caused Capt. Groeling to expect an impending dual-engine flameout; they still had 300 pounds of fuel indicated.

As the aircraft crossed the displaced threshold, the No. 2 engine flamed-out 20 to 30 feet over the runway, and Capt. Groeling immediately transitioned to an autorotation profile. At five feet, the No. 1 engine flamed out, and he completed the autorotation to a skids level slide-on for more than 750 feet. The only damage was some slightly worn skid shoes that did not require immediate replacement.

The postflight inspection ruled out fuel contamination. Maintenance verified about 200 pounds of fuel still was available after the flameout. Later that night, they determined the source of the failure: The one-inch line connecting the two aft fuel cells had malfunctioned, causing the indicator to show fuel available, but the fuel was inaccessible by the fuel pumps, resulting in fuel starvation with usable fuel indicated.

Put a Band-Aid on It

I was underway on USS *George Washington* (CVN-73), somewhere in the Caribbean, bleeding out my side, and staining the dull green of my flight suit and safety gear a deep red.

By Lt. Kevin McElroy

The E-2C carries three NFOs in its combat-information center (CIC). We each have different preflight procedures, depending on which seat we are assigned. I was in the radar-operator seat, and my preflight duties were to make sure the radios and sensor-electronics boxes in the forward-equipment compartment (FEC) worked. Everything had checked good, but we still needed codes loaded for our secure radios and data link.

I took my seat and was running up the system while we waited for our aviation-electronics technician (AT) to finish loading the codes. The mission commander (MC) asked me to go forward to check on the AT's progress. I got up, shuffled forward through the tight passageway of the FEC, and asked the AT how he was doing.

"One box left, sir," he replied.

I headed back aft to my seat. Just before passing through the door to the CIC, I felt my survival vest momentarily snag on something. Then I felt a hard object press into my side. I passed through the CIC door and sat down in my seat. The hard object pressing into my side was gone. I assumed it had to have been one of the metal fittings that hold my harness together. I reached under my survival vest and tried to find the suspect fitting—nothing was there. I felt no pain and figured the harness had shifted back into place on its own. I was ready to dismiss the whole thing and continue with my preflight. But, when I pulled my hand out from under my equipment, my hand emerged completely covered in blood. I usually don't bleed that much from the abdomen on preflight.

"I'm bleeding." I told the other two NFOs, as I looked at my hand.

The air-control officer (ACO) pulled out the first-aid kit and told me to "put a Band-Aid on it."

"No, I'm bleeding," I said. This time, I held my blood-covered hand up in front of the MC.

"Get out! Go!" the MC commanded me. This order shook me out of the initial shock of what just had happened. We both got up and rushed out of the plane, past a very surprised AT.

On the flight deck, with the noise of aircraft engines all around, yelling "I'm bleeding," will not make you understood through everyone's double-hearing protection. Taking off your survival vest and pointing to the large maroon stain under your arm that is slowly growing downward more effectively will get the point across. The display of blood worked: The flight-deck chief spotted me and quickly got the attention of a medic. I was rushed into the medical station behind the island.

After the medical team had taken my vital signs, took an X-ray of the wounded area, and stitched me up, I was told my survival knife had deployed inside its pocket on my survival vest. It had cut through the vest, harness, flight suit, and my body, making a hole in my side about an inch long and an inch deep.

My squadron uses a Benchmade, 154-mm, drop-blade survival knife. It will not flip open unless the safety is off, and the switchblade button is pressed. It is designed to be operated entirely by one hand.

Why did my knife deploy unexpectedly? Was there a problem with the safety on my particular knife? Had my movements through the cramped FEC forced down the safety? Had a gremlin crawled into my vest in an attempt to murder me? The answer is impossible to know.

Impossible, because I had not adequately preflighted my gear. I checked my survival radio, and I checked that my emergency oxygen bottle was full, but I did not check the pocket with the knife. I had checked it on previous flights but only to see that the knife and flare in that pocket were present. I never had checked the safety. To my memory, I only can recall taking the knife out of the pocket once to check its operation. Our parachute riggers are required to do gear inspections every 30 days, and they do check the safety on the survival knives. A week had passed since my gear's last inspection.

I now realize it is not enough to check the presence of items in the survival vest. The proper operation of those items also must be preflighted. Do a thorough preflight, and you won't find yourself thinking, "I don't normally bleed this much from the abdomen on preflight."

Lt. McElroy flies with VAW-121.

Our first indication of this incident in the ready room was the 1MC call, "Man down. Man down. Man down on the flight deck, battle-dressing station." Soon the bitch box at the duty desk squawked, "Ready 7. Primary. That's one of your aircrew." My heart sank as I envisioned a hot-pump crew switch, propeller-arc incursion, or a broken ankle from falling off the aircraft. As I investigated further, it quickly became obvious what had happened. We isolated the gear for the flight surgeon to determine the source of puncture. Then we went to medical to provide good will to our ailing young Jedi. My take-away from this was verification of the "expect the unexpected" mantra. A well-trained, watchstanding team is critical to success when a mishap occurs, no matter how different it may be from the ones you practice and study.—LCdr. Paul Lanzilotta, safety officer, VAW-121.

Cold and Quiet at Angels 16

By Ltjg. Nate Lyon

I was a nugget on my first month of deployment, and I was probably one of the few pilots excited to go flying in the prevailing weather conditions: icing, snow, freezing rain, and low overcast. The poor weather forced the cancellation of the first three events of the day, but conditions had improved for us to launch on a large-force strike as part of the Foal Eagle 2006 exercise. I was Dash 2 in a section of strikers tasked to deliver simulated laser-guided weapons on a target located in a range complex.

My lead's aircraft went down before launch, and I subsequently became a single ship—alone and unafraid. Once airborne, my first task was to penetrate 16,000 feet of clouds in potential icing conditions and climb overhead to get gas from an Air Force KC-135. Having only tanked a few times on the Iron Maiden in my short career, I looked forward to getting that task out of the way, so I could focus on the mission at hand. Once on top of the clouds, I found the tanker, got into the basket, and almost was topped off when my aircraft began to exhibit several unusual indications.

The first problem was a master-caution light, with an associated master-caution aural tone. An occasional electrical hiccup, with the associated momentary cautions, is not unusual in the Hornet. Although things were going smoothly on the tanker, I initially thought I might have damaged an AOA probe while receiving gas. But, almost as quickly as the master caution had appeared, it went away. I subsequently chalked up the event to "stray trons."

Five minutes later, as I began to separate from the KC-135's fuel hose, the master-caution light illuminated once again. This time, however, all of the aircraft's displays, including the heads-up display (HUD), which is our primary attitude indicator, flashed briefly. Once again, though, electrical power was returned almost immediately. I did, however, make a mental note of what had occurred as I detached from the tanker and shifted my focus toward navigating the unfamiliar foreign airspace.

A short time later, the jet told me once and for all it had not simply been crying wolf. This time, every cockpit display again disappeared. I found myself referencing the backup steam gauges for the first time since an early instrument simulator in the FRS. Also, the power to both radios and to the up-front-control, the keypad through which most communication and navigation functions are accessed, had been lost. The issue that most concerned me at the time, however, was the temperature in the cockpit: It had become extremely cold in a matter of seconds. I did everything I could think of to heat up the cockpit, but I couldn't change the inside temperature.

As I struggled to regain heat, I noticed that the jet also had an RGEN (right generator offline) caution and a GEN TIE caution. These two cautions meant the right generator had dropped offline, and the left generator had not accepted the load. The FA-18 electrical system is designed to maintain full functionality in the event of a single generator failure by automatically shifting electrical power from one generator to the other. In this instance, the system had failed.

Fortunately, two of my five cockpit displays returned shortly after they had been lost. I was able to display the HUD on my left digital indicator and began to use it again as my primary attitude reference. I noticed the HUD was missing key pitot-static information, and I had lost the air-data computer. The TACAN


U.S. Air Force photo by Tech. Sgt. Rob Tabor.

I found the tanker, got into the basket, and almost was topped off when my aircraft began to exhibit several unusual indications.

had dropped offline, which limited my options for navigating back to the ship in IMC. The severity of the situation began to sink in. I was a single at 16,000 feet, on top of an undercast, with known icing conditions, unable to see the ship, NORDO, and with a rapidly decreasing cabin temperature.

I figured I had experienced a generator malfunction, but there was some disparity between the indications I had and those listed in the NATOPS pocket checklist (PCL) for a right generator failure with the bus tie open. For example, the loss of both radios was not on the list. I should have retained COMM 1 with backup battery power. I later found out this malfunction was a completely separate issue. My primary concern, however, still was the decreasing temperature inside the cockpit. The PCL did not point to any type of environmental-control system (ECS) loss with this particular failure; although, failure of the bleed-air system does occur with the loss of both generators.

The cabin remained pressurized, and I had good oxygen flow to the mask, but I decided to pull the emergency-oxygen green ring, just in case. Then I set an emergency squawk of 7700, via the backup IFF control, in an effort to get the ship's attention and to have a wingman join on me.

Still unsure of exactly what I was dealing with, I continued to thumb through the PCL to make a more accurate diagnosis. I rapidly was approaching an extremis situation and needed to do something quickly to warm the cockpit. I already had completed the emergency procedure for a failed right generator, which consisted of resetting the generator switch. This procedure did nothing to change the current situation. The only other option that came to mind was to cycle a guarded switch labeled Gen Tie, which essentially would override the fault-protection logic in the system and allow the good generator to pick up the load of the failed one.

With some reluctance, I moved the Gen-Tie switch to the RESET position. I hesitated because this switch overrides all fault-protection logic and ties the generators

directly. Initially, nothing happened, but, when I again tried to reset the generator, this time with the Gen Tie switch in the RESET position, power was restored to all systems. When I selected a radio frequency and tried to send out an emergency transmission to the boat, though, system power again was lost. As I stopped to ponder what just had happened, I looked outside the cockpit and realized no one had joined; I decided to try one last generator reset. All power and all systems again were restored. In the following minutes, as warm air once again began to flow from the ECS system, feeling began to come back in my numb hands.

For the moment, I felt relieved. My first priority was to establish radio contact with a squadron rep, who I was sure was standing by after my emergency squawk popped up on the carrier's air-traffic-control scope. My suspicions were confirmed when I heard a guard call with my aircraft's side number. I changed my squawk back to normal and soon was having a conversation with my commanding officer about what just had occurred. He slowly stepped me through the remaining NATOPS procedures. Neither of us could determine why my aircraft had lost all pitot-static and air-data-computer information, so he had me do an additional on-speed AOA check. At this point, everything in the cockpit had returned to normal, and I headed back to the boat for a low-visibility, high-wind, Case III approach. I made an uneventful arrestment.

If any non-Hornet aviators still are reading this article, I'll move on to some lessons learned, ones that I believe can apply to any platform. First and foremost is that NATOPS is printed for a reason. When faced with an emergency, pilots must be disciplined enough to read all applicable items in NATOPS. In my situation, I treated the right generator failure as more important than the Gen-Tie caution. I now know this mistake could have had grave consequences. By disregarding step one of the Gen-Tie procedure, the one that instructs the pilot to leave the Gen-Tie switch in the NORM position, I inadvertently could have cut off all electrical power to the aircraft and had to eject.

The NATOPS manual clearly states, "If the left and right buses are isolated because of a detected fault, cycling the Gen-Tie control switch reenergizes the faulty bus/equipment and may cause further damage or loss of the remaining generator." Because the FA-18's batteries are only operable for about 20 minutes, provided they have a full charge, I could have shorted out the left generator and subsequently had a total electrical failure. If that had happenned, as those 20 minutes of battery power expired, the aircraft's flight controls would have become barely useful, and all electrical equipment would have been lost. With my aircraft above a solid cloud deck, having no navaids, no communications, no wingman, and a marginally controllable airplane, I easily could have found myself in an ejection scenario.

This situation should reinforce how important it is to dust off the big NATOPS book from time to time. Knowing the boldface is important, and just reviewing the PCL every week before an immediate-action exam isn't always sufficient. Not being familiar with the subtleties of all aircraft systems could have disastrous consequences. As it turns out, the cold cockpit actually was a malfunction associated with this emergency, but was listed only in the big NATOPS manual. Had I known this information, I would have been much better equipped to solve the problem and less likely to have taken action outside of NATOPS's guidance. Also, we should not assume that the PCL will tell us everything we need to know regarding system failures when we are airborne.

Perhaps one of the biggest take-aways from this incident comes from something we were all told many times throughout flight school: "No fast hands in the cockpit." The salty old simulator instructors always told us the first thing a pilot should do when faced with an emergency is "punch the clock." Time is more than likely the one thing we do have on our side.

When looking back at what had happened, I am reminded of the importance of thoroughly preparing for all aspects and contingencies of a flight, emphasizing not only the tactical portions but the administrative side, too. Proficient carrier aviators often barely touch on possible emergencies during their flight briefs because they are focused mainly on getting bombs on target and shooting down bad guys.

Instead of simply briefing the standard NORDO procedures, I suggest a discussion on the finer points of being NORDO, alone, in bad weather, while flying on the standby instruments. This training might be more valuable and could prevent a mishap. I now place extra emphasis on in-flight emergencies because mental preparation for such events is just as essential a piece of flight gear as a helmet, pubs and nav bag.

Ltjg. Lyon flies with VFA-34.

Winging It in the Cold

By Capt. Matthew Polus, USAF

It was a cold day, as it typically is in Alaska during October. Our squadron had sent four EA-6Bs to participate in Cope Thunder, a Pacific Air Force Exercise located at Eielson AFB. I was crewed with the XO and two other junior officers. During the brief, almost the entire crew was concerned about a head cold that was going around the squadron. We were able to clear our ears, so we pushed forward.

As we approached the hold short, I called for takeoff-in-order. Because of recovering aircraft from the previous vulnerability window, we were told there would be a delay. After 15 minutes, tower began clearing aircraft behind us to take off. We repeated our takeoff call to tower. Ultimately, we waited about 40 minutes to get airborne.

By this time, we were battling the weather, mild head colds, and being significantly late to take off. We took the runway, got airborne, and, as we climbed through 10,000 feet, I called for cabin pressure as part of the climb checks. The XO reported, "Holding steady at 8,000 feet."

About two minutes later, we felt a slight relief of pressure in the cockpit. As we leveled off at FL200, the cabin pressure climbed toward 20,000 feet.

We asked center for a lower altitude and RTB because of cabin-pressure failure. Center instructed us to stand by. We now had two options: stand by and wait for center to clear us lower or declare an emergency to expedite the descent out of FL200. Aircraft from the previous vulnerability window still were recovering, and all were low on fuel, because of Eielson's single-runway ops. Declaring an emergency certainly would result in several aircraft diverting to Elmendorf AFB, about 225 miles south. We opted to wait for center to clear us lower and not declare an emergency.

All seemed well as we descended toward the airfield on short final. The XO landed on the long runway, which is 14,507 feet. After we cleared the runway, the XO told the crew we slid quite a bit as the brakes were applied. Because of the sheer length of the runway, we never were in danger of sliding off the end. However, if we had been landing at Midway Field in Chicago, the results could have been quite different.

During the debrief, we researched the procedures required by NATOPS and our standard-operating procedures (SOP) for cold-weather operations. We quickly realized the Prowler community does not have written standards for operating in cold environments, such as minimum RCR conditions for taxi, takeoff and nonarrested landings. Our safety department has drafted an addendum to the wing SOP, detailing required minimum RCRs for taxi, takeoff and landing.

As aircrew, we should have plans in place for every predictable situation. Operating in cold weather with snow and ice on the airfield, certainly is possible and should be approached with written standards in hand. Don't be afraid to submit changes to SOPs based on your experience; it may be vital for someone in the future.

Capt. Polus flies with VAQ-133.

Tweener Weather

By Lt. Andrew Gastrell

"Nose down, idle…."

I never before had said that while two miles aft of the carrier on a night Case III recovery. However, one bizarre night, I said these words to the level-3 pilot (3P) while he tried to complete his initial carrier qualification and renewal of his carrier-landing currency. In retrospect, I should have known something was amiss as my squadron's three NP2000 Hawkeyes, along with two S-3B Vikings, launched off the front end of USS *George Washington* (CVN-73).

During preflight planning for the CQ evolution, the weather brief had described a line of thunderstorms that would approach later in the night, bringing increased winds with them. Our ceilings and visibility wouldn't be a problem, and the system would blow through before the next morning's flight ops. I thought, "Not great, but good enough to go flying." After all, we only needed four traps.

After the brief, LCdr. Weather Worry-Wort complained about going flying in less than ideal weather. LCdr. Salty Mustache, an S-3B transition NFO, scheduled to fly in my aircraft that night, said his fears were just another example of what happens when a reduced op tempo limits an aviator's exposure to weather.

Man-up and launch on the dark-and-windy flight deck went off without a hitch. We launched and went straight to marshal for some ironically titled "comfort time." After 20 minutes, we commenced our approach. As we got lower, we felt increased turbulence buffeting the aircraft. At 1,200 feet, we were in the middle of very violent turbulence.

At 14 miles, I asked Salty how he was feeling, chiding him with, "And you said we were scared to fly in any kind of weather."

Little did I know what was about to happen. The two S-3s ahead of us told the ship they were experiencing severe turbulence, and, in turn, each one was waved off by the landing-signal officers.

We had good bull's-eye azimuth information and acquired our automatic-carrier-landing-system (ACLS) needles on cue at six miles. As we bounced around like we were off-roading in a Pinto, the nervous 3P did a good job fighting the aircraft through the rough environment.

While flying the ball during field-carrier-landing practice (FCLP), the young pilot at the controls had a known tendency to add unnecessary power and consequently become substantially overpowered. We had briefed this trend, and, as aircraft commander, I was ready to quickly address it should he slip into his old ways. At two miles, when we should have been at 800-feet AGL, we rapidly rose to 2,000-feet AGL. This

quick altitude change took me by surprise.

"Easy with it," I said, as I watched the altimeter climb and our ACLS glideslope needle fall. "Wow, I've never seen him add this much power," I thought.

"Easy with it," I said again.

I felt no extraneous G-forces on the aircraft because of the turbulence, so my ever-important, seat-of-the-pants feeling disagreed with what my eyes saw on the instruments. Momentarily confused, I trusted my flight-school training and relied on the instruments.

This isn't right. Then I said, "Nose down, idle."

The junior pilot pulled back the power levers and pushed over the nose to a completely uncomfortable attitude looking down at the back of the ship. We were 1,200 feet higher than we wanted to be. As our rate of descent increased with our airspeed, we gradually approached the correct profile for the approach.

"601, three-quarter mile, on course, above glide-path, call the ball," said the final controller.

Just as we received that transmission, we saw the ball on the very top of the lens.

"601, Hawkeye ball, 5.0."

At idle the entire way until just over the ramp, our hook caught the 4-wire, and we came to a stop. Effectively, we just had executed a precautionary-emergency landing to a carrier arrestment.

"Nice job. Three more to go," I said.

Without a second thought, the flight deck taxied us to cat 1, and we quickly launched into the blackness.

The two E-2s behind us waved off because of winds and weather. Airborne again, one of the Vikings called, "700 is seeing 60-knot airspeed fluctuations and is experiencing severe turbulence on base leg."

I looked down at my instrument panel, saw my airspeed indicator waving like a stereo needle, and then echoed, "601, also experiencing severe turbulence and 70-knot airspeed flux."

The ship trapped all the aircraft and kept us on deck for more than an hour as they steamed away from the bad weather that rapidly enveloped the carrier's working area. The ship eventually found clear air, and we completed our CQ requirement.

After shutting down for the night and putting our gear into the paraloft, I spoke with our squadron safety officer, who happened to be in CATCC as our representative that night. While he was in CATCC, one of the controllers came up to him during our first pass and whispered in a quiet, worried tone, "Uh, sir, we just saw… 601; they just climbed 1,500 feet in a few seconds."

As it turned out, two squall lines had converged on the carrier. Their microbursts had wreaked havoc on our approaches that night.

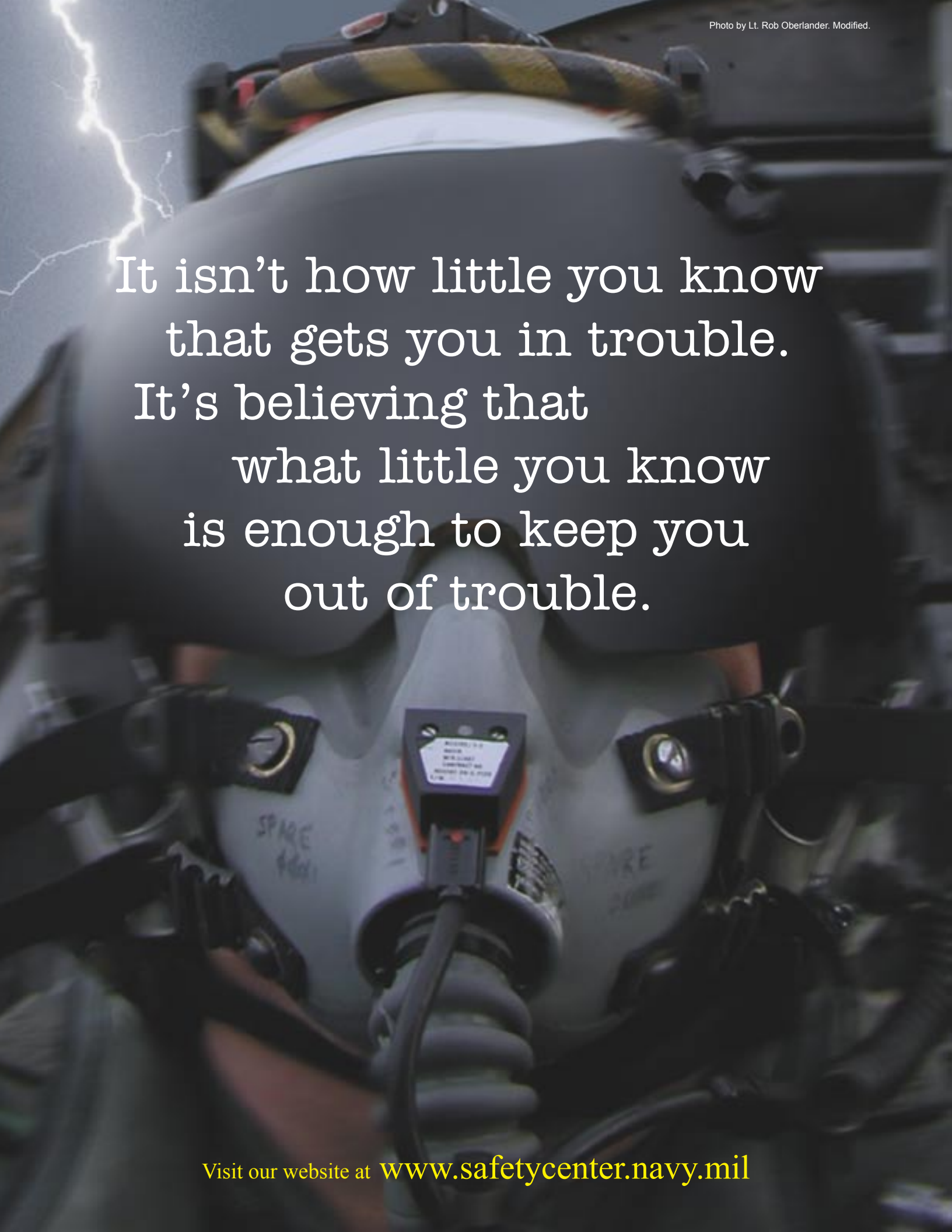
What we ran into was a "tweener" weather situation on our preflight and initial phases of the mission—while we had a carrier-operations mindset. The weather brief hadn't given us any reason to abort the hop, and we definitely communicated the weather to CATCC while we were flying.

It didn't occur to us to stop the evolution as we taxied to the catapult after our first trap. Perhaps we were in a can-do mindset because we were executing CQ, and our habit pattern drives us to continue, even when we've exceeded our comfort level. CATCC could have called earlier for a pause, but they might not have been able to clearly discern the extent of the hazard to flight operations.

When extraordinary circumstances occur, it is better to forcefully voice them with a squadron rep or directly with tower personnel. Make a recommendation to stop before taking the catapult stroke. The next time Mother Nature exerts her authority, the outcome may be different.

Lt. Gastrell flies with VAW-121.

Photo by PH3 Christopher Stephens. Modified.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that gets you in trouble.
It's believing that
what little you know
is enough to keep you
out of trouble.
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