THE NAVAL SAFETY CENTER'S AVIATION MAGAZINE

# approach

March 2002

## Learning From Other's MISTAKES

## A Lesson in Teamwork

## A Cool, New Experience

# approach


**The Naval Safety Center's Aviation Magazine**

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## Mission Statement

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.

# Features



# March Thanks

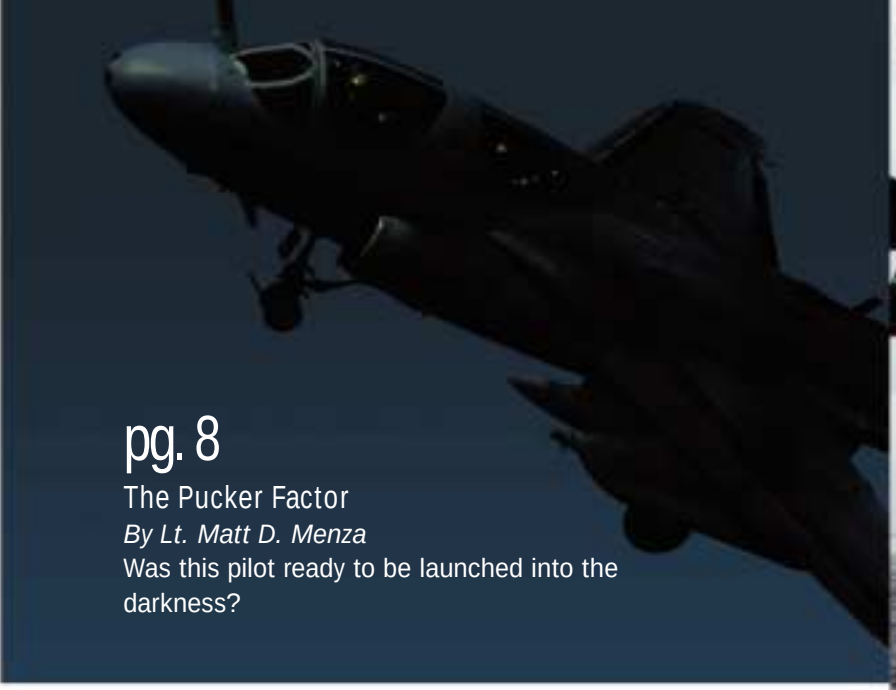
Thanks for helping with this issue...

LCdr. Louis Mosier, CFK

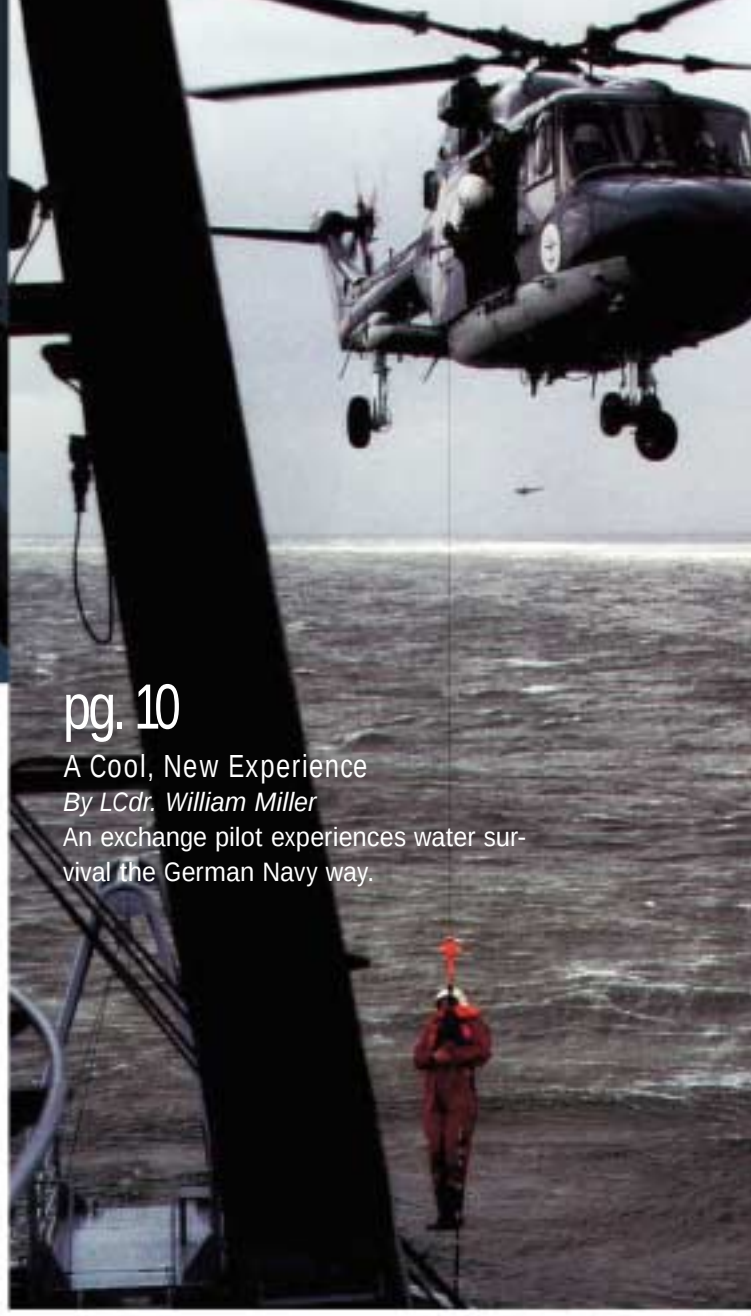
Capt. Edward Rodgers, USMC, VT-2

LCdr. Kent Mathes, VAQ-140

Lt. James Meadows, HSL-48











# Departments

# Learning From Other's MISTAKES

*By Lt. David Person*

Last July, my father visited me in Jacksonville. He always has supported my naval aviation career, and, over the years, has hinted at wanting to take flying lessons. His visit seemed to be the perfect opportunity to share the joy of flight with him. I could not wait to give him a glimpse of my profession and had no idea just how complete it would be.

We rented a Grumman Tiger from an FBO in St. Augustine for a one-hour flight to Cedar Key, a remote community on Florida's west coast. The flight was smooth since the daily summer convection had yet to build. As we approached Cedar Key, we tuned the CTAF, made our required traffic calls and set up for a downwind entry to runway 23. The landing strip at Cedar Key is fairly short at 2,300 feet, but it's certainly manageable. However, the runway is 100 feet wide, which makes it look much shorter, and each end is surrounded by swampy sawgrass. I had been warned about the runway conditions at the FBO before departure and planned to land as close to the numbers as possible. The Grumman touched down 50 feet past the numbers, and we rolled to a slow taxi. As we neared the parking area at the departure end of runway 23, we discussed breakfast plans but were interrupted by a radio call on the CTAF from a Cessna that was entering the pattern.

My father and I shut down the plane and were pushing it to a parking space when the Cessna rolled final. What followed was disheartening. The plane floated down the runway, fast and long. It eventually touched down with only 300 feet of asphalt left. It appeared as if the pilot initially tried to brake but then elected to add power for a go-around. With 100 feet of runway left, the engine revved and the nose came to a sickeningly high attitude. They were going 40 knots when the plane smashed through thick shrubs at the departure end and then descended into the water. The main gear drug through the marsh for 100 yards before the left wing contacted the water. The plane then cartwheeled and pirouetted before smashing into an oyster bed on its back.

My father began trudging through shin-deep mud and weeds toward the plane. I joined him after a mayday call on the CTAF and 121.5. The going was rough, and I

Digital illustration and photo-composite by Allan Amen

They were going 40 knots when the plane smashed through thick shrubs at the departure end and then descended into the water.

tried to prepare myself for what might be in the cockpit. As we got within 10 feet, the door of the Cessna 172 opened, and four muddy souls emerged, slightly cut but otherwise uninjured. This seemed miraculous, given the force and sound of the crash.

I began to review the NTSB report mentally: insufficient runway available to execute a go-around, extremely high DA, aircraft overweight, and crew inexperienced. The crew failed to identify hazards, to assess risks, to implement controls, and to break the chain.

What could I learn from this accident? After all, this guy was an inexperienced pilot with just over 100 hours flying a $40,000 aircraft. I am a Navy pilot with 1,000 military hours flying a $40 million helicopter. But as I thought about every mishap I've heard about in my Navy career, there were common themes.

Mishaps have the greatest chance of occurring when aircraft are flown at or near their limits, or when pilots meet or exceed their personal minimums. The Cessna pilot had exceeded both. He failed to identify and to avoid a perilous situation that left him at the end of the runway with no hope of stopping. He then demanded performance from his aircraft that it was unable to deliver. These links in the chain came together and caused this crash. We land aircraft all the time, but we also do so much more. We fly at night, from a ship, in horrible weather, over mountains, and in hostilities. The links in our chains are even more insidious and more complex. I realized the mechanics of a mishap are the same for every level of flying. Mishap avoidance is about breaking links, about going around early or about knocking it off.

Lt. Person flies with HSL-48.

Photo by Matthew J. Thomas

# Please Stop ROLLING!

*By Lt. John Isaacson*

It started off as a five-hour pilot trainer and was my third flight as an instructor pilot. I had to complete two events that, together, would cover every P-3 emergency and malfunction we learn. We worked through multiple-preflight issues and still planned to have the necessary daylight to complete both events.

As the instructor flight engineer (IFE) and I walked in the hangar (to bounce one more question off the maintenance officer), the operations officer approached me with, "Catfish, I need you to do something for me on your flight."

I'm thinking, "Oh no, drive-by tasking."

It turned out we needed to bring a load of CADs to a Canadian airfield so their C-130s could take them to Chile for a detachment. I never would get off the deck in time to get both events done, so we cancelled one of them. I could tell it would be one of those days.

We made sure our cargo was secured and adjusted our training profile to accomplish a portion of the training en route. We would land in

Canada, drop off the CADs, then complete the remaining training, which we considered to be unsafe with the CADs onboard.

I was in the left seat, the copilot (student) was in the right seat, and the student flight engineer (SFE) was in the FE's seat. We shut down the engines and completed the secure checklist. As we were getting out of our seats, the SFE asked the IFE if he had simulated a hydraulic system quantity loss in our No. 1 system. The IFE replied, "No," and directed him to secure the hydraulic pump. The system still indicated pressure, so the IFE told the SFE to turn on another pump to assist in troubleshooting a possible gauge malfunction. The system pressure started bleeding off, going from 3,200 to 0 psi in about three seconds; we immediately secured the pump.

I looked out of the aircraft and noticed the lineman pointing at our port mainmount. The IFE and I went aft to exit the aircraft and to verify the hydraulic leak. As the ladder lowered, we noticed hydraulic fluid raining from the port wheelwell. By the time the ladder was completely down, the hydraulic fluid had flowed aft, past the ladder. We looked for the leak, and I noticed the lineman did not put in the chocks after shutdown—the aircraft started inching aft. The IFE told the lineman we needed chocks, and I ran up the ladder to see if we had any onboard. As I stepped into the aircraft, I quickly learned how slippery hydraulic fluid is. I found myself on my back a split second after I stepped off the ladder's non-skid. I didn't find any chocks but thought the lineman soon would be returning with them.

We needed to find something to secure the aircraft until we were able to get a set of chocks. As I went down the ladder, I spotted a forklift with a wooden pallet that was to be used for downloading the CADs. I was talking to the forklift operator about using the pallet, when I heard a loud pop. I turned around and noticed the ladder was bending forward and "popping" as it bounced aft because the aircraft had picked up speed. I directed the copilot to raise the ladder and proceeded to take the pallet. As I looked aft of the aircraft, I noticed two antennae that each wing could strike, and, if the P-3 got past them, a ditch, a fire hydrant, and a hangar. My heart immediately sank as I thought, "I signed for this aircraft." I dragged the pallet off the forklift and I noticed two puffs of smoke coming from the plane's starboard side, but I couldn't tell where they were coming from. The smoke then stopped. I tried to shove the pallet behind the mainmount when I again noticed the smoke. I asked the IFE if he knew what it was, and he said he had told the copilot to use the emergency brake. The smoke actually was atomized hydraulic fluid from the emergency-brake system, which is a normal by-product of its use. I had my hands over my eyes, peeking through my fingers in hopes the aircraft would stop without damage.

The aircraft came to a stop approximately 15 to 20 feet before the mainmounts reached the edge of the tarmac, and then it began rolling forward. Great, now how far is it going to roll forward? The aircraft finally settled into a slight dip with no damage. We found the hydraulic hose for the main brake had blown upstream of the brake fuse, which is designed to prevent complete loss of hydraulic fluid. Our squadron sent a rescue aircraft and crew for us that evening, and the aircraft was repaired and returned to the squadron that night.

What could we have done differently? I now inspect that hose more closely on preflight. Since there is no backup system to the parking brake, the only sure way to prevent a 100,000-pound aircraft from rolling out of control is to bring your own chocks, especially when you are going to a foreign field.

Lt. Isaacson flew with VP-40 and is currently with VT-2.

We needed to find something to secure the aircraft until we were able to get a set of chocks.

# Up We Spiral

*By Anonymous*

We had completed a Cobra detachment at NAS Fallon and planned to get on the boat the following week. Things were hectic as we packed up the maintenance shop. It made logistical sense to have the maintenance personnel daily and turn-around the birds, get on the road, and then have the pilots button up the aircraft after preflighting. Operations weren't smooth at Fallon, and the det OinC (with whom I had been combat-crew) felt pressure to get ready for the boat. (We can do this; that's what we're paid for, ain't it?)

We planned the route to take us near the Lake Tahoe area, where we would weave our way through the passes—average height 7,000 feet, with some mountain peaks over 10,000 feet—and continue west. After checking our fuel calculations, we would have plenty of gas at our destination, but just in case, we found an airport that had fuel, and we needed to contact the FBO. We made seven phone calls but couldn't find someone to give us gas, so we gave up, and pressed without a PPR or confirmation the FBO was open. (We don't need gas anyway, we'll land with almost 30 minutes of fuel.)

Our brief from the weather-guesser showed any clouds in our path would dissipate before we reached the Sierra Nevada Mountains. We looked at the radar screen and agreed with the weather briefing. The freezing level was between 6,000 and 7,000 feet. We filed VFR and pressed on. (If we stay clear of visible moisture through the pass, no problem.)

Since we'd been flying together for a while, the crew brief concentrated on the route, frequencies and controlled airspace but not on weather contingencies. Both aircraft had experienced, reliable pilots able to make the right decisions. (Hmm…)

We preflighted, started and then learned Dash 2 had a hydraulics problem, and he shut down to troubleshoot. We knew weather wasn't improving at Fallon. They went next door for help, while we departed the area and headed west. (The sooner I get there and settled in, the better.)

Well, we got to the mountains and quickly realized the front had not progressed east as forecasted but had pushed up against the west side of the mountain chain and stopped. As we looked at the clouds, I could tell they went high, but the pass still looked workable—we pressed. I hadn't signed for the aircraft, and since we hadn't briefed a solid bad-weather game plan, I didn't have a clear idea what the OinC or PIC were thinking. By this time on the route, there was no fooling either of us since snow and dark clouds blocked the pass. What was great, though, was the crystal-clear, blue sky over us and to the east. Then we had a great idea: See how high the tops are, go VFR on top, and when the weather breaks-up on the west face of the mountains, descend and continue VFR. (Sure, we can always turn back. What's bingo fuel from here?)

Up we spiralled—Angels 8, 8.5, 9, 9.5, 10 (Hey, doesn't OPNAV 3710 say something about not flying above 10,000 feet without a nose hose?), 11, 12, 13, 14,

all the way to 14,300 feet. (I wonder what the service ceiling on this thing is? Flies a bit different up here.) For the stiff-wingers, most Cobra drivers don't relish flying above 500-feet AGL. Yes, we were CAVU on top, but below, the weather wasn't getting any better—we pressed. Even after almost forcing my eyeballs out of my head for another 15 minutes, I didn't see a sucker hole for miles. I felt a tightness in my chest but didn't know if it was the onset of hypoxia or an anxiety attack. As we tracked our progress on the navigation system and TACAN cuts, the PIC expressed concern about our fuel state. I was blissfully ignorant because you can't scan the gauge from the front seat.

Finally, the cloud tops began to come down and we descended, but still with no sign of terra firma, just a floor full of cotton as far as you'd like to look. As the fuel got lower, it became clear we had to land, and soon. The only solution was to shoot a TACAN approach to the field where we didn't have the PPR or even knew if there was fuel. The PIC took the controls and handed me the terminal FLIP pub while setting up his instrument scan to intercept the IAF.

We still were unable to get weather at our destination and, on top of that, we didn't have an alternate (I hate when this happens).

Fortunately, as we descended through the freezing layer, the weather broke, and our sucker hole appeared. From there, we picked our way through the scattered, occasionally broken clouds, to find our destination and landed.

On postflight, I opened the No. 1 engine bay and discovered the access panel for the tail-rotor drive shaft had not been secured. It was resting against the opening where you can access the shaft. If that panel had decided to shift into the access hole or against the drive shaft, we would've lost our tail-rotor thrust and crashed. That could've been fatal on a VFR day in the pattern at home field. What would we have done at 14,300 feet, over mountainous terrain, while VFR on top? What could we do with any "land as soon as possible" under those conditions? Probably kill ourselves.

On debrief, we looked at the FLIP pub to check how the approach would've worked out, and realized there wasn't an approach at the divert. I still to this day don't know which approach plate we were looking at.

I knew we were writing an *Approach* article as we climbed to go VFR-on-top. Why? Our can-do mentality, a bad case of get-there-itis, overestimating our ability, poor crew coordination, little planning for contingencies, and not trusting our instincts all played a factor. If something doesn't feel right, it probably isn't. Never assume; get a confirmation on what you expect. If you think you're that good, you probably aren't.

Helo photo by Cpl. E.M. Thorn
Photo-composite by Allan Amen

# The Pucker

By Lt. Matt D. Menza

Aviators often relearn the lessons of those who came before them through their own experiences. This experience often comes with a high level of pucker factor, solidifying these lessons for a lifetime. I never really understood the true meaning of pucker factor, until I began operating around the boat.

As a Prowler FRS student pilot with 50 hours in type, I was learning to listen to my elders, who often ended briefs by telling me to check this or that before the cat shot. My second CQ, catapult shot at night would forever teach me to listen to those side notes and pieces of wisdom, passed down from more experienced aviators. Sure, I knew the procedures, but I didn't always remember the, "Oh, by the ways." They seemed less important than my emergency procedures or boat procedures.

On the second night of CQ, we smoothly set up in the catapult, and the shooter signaled us into tension. I went to military power and began checking my gauges. All tapes, hydraulics and oil looked good—no warning or caution lights, feet off the brakes, I gave the other crew members a final vote; they were ready. I turned on our external lights to signal to the catapult shooters we were ready to be shot off into the night. About three seconds later, our 56,000-pound jet was accelerating from zero to 140 knots in less than 300 feet. At the end of the stroke, I called, "Good motors and tapes, gear coming up," and I felt something hit my control stick. Despite this, I concentrated on my instruments and tried to fly away from the water.

I over-rotated a few degrees off the cat, and we were climbing too steeply to accelerate. I tried pushing the stick forward, but it would not move. I shifted my scan to the base of my stick where I saw the radar-screen filter laying snuggly between the radar display and the control stick. The pucker factor reached a new level for me.

As I felt my seat cushion slowly being sucked into my bowels, I came up with a quick plan. I had to keep the stick forward to prevent the 7-inch diameter, quarter-inch thick, piece of glass from slipping down into the controls and out of my reach. I also had to take my scan off

Photo by Ted Carlson, digitally altered by Allan Amen

# Factor

## I over-rotated a few degrees off the cat, and we were climbing too steeply to accelerate.

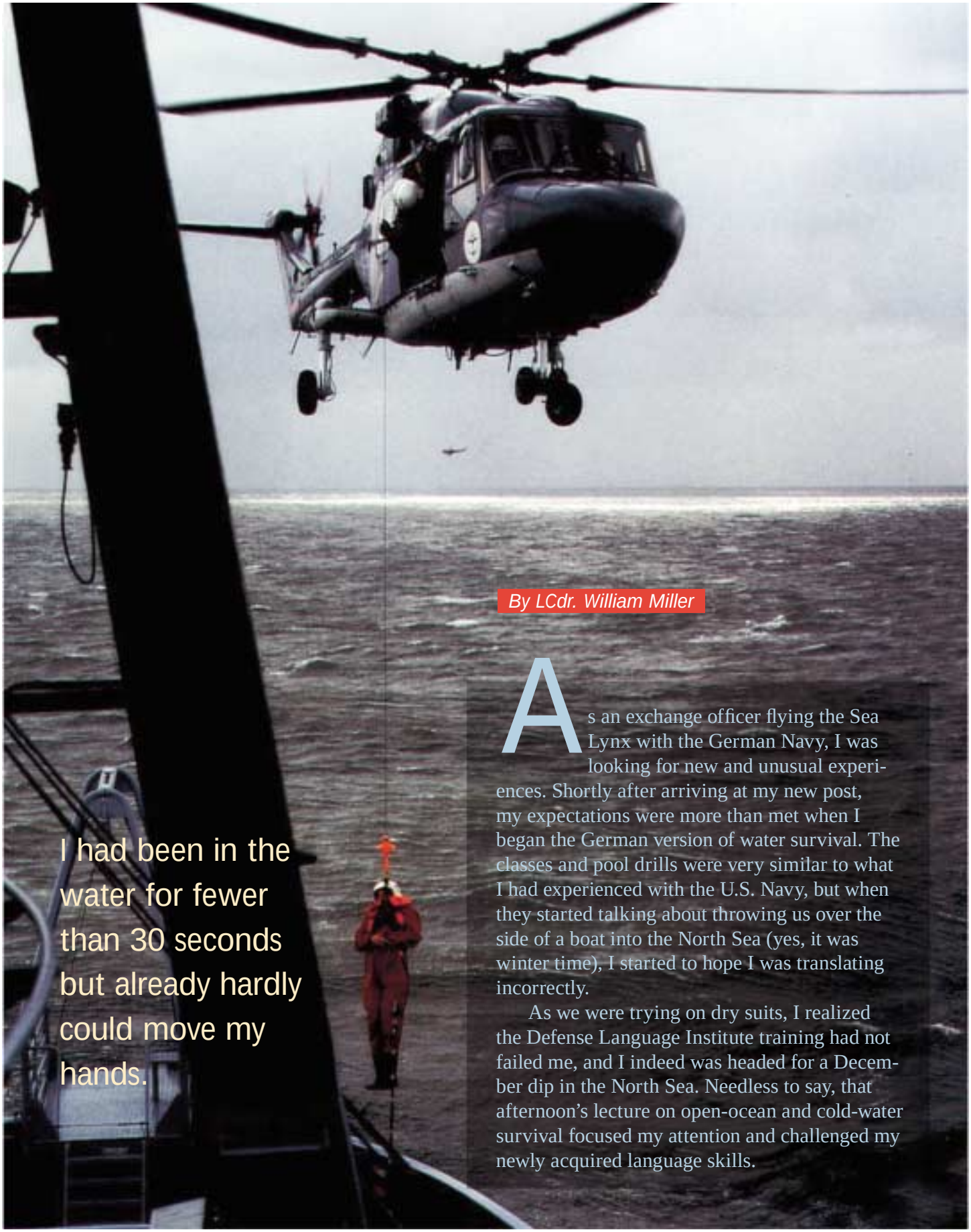
the instruments and reach my stubby little arms down, forward of the stick, to retrieve the large piece of FOD. I needed to pull back on the stick, and, at the same moment, grab the screen before it could drop deeper. This would require a slightly more nose-up attitude, which already was causing anxiety among the other crew members.

At 155 knots and 16-units nose up, with no acceleration, passing 600 feet, it was time to move. I executed my plan and grabbed the screen without dropping it. I quickly jabbed it into my rightseater's lap and said, "FOD, don't let go."

He calmly took it and said, "Roger."

Finally, I could push the nose over and accelerate up to the flap-retraction speed of 185 knots. I further accelerated to a safe and low-pucker-factor speed of 250 knots. After the night CQ, I thought about the words of my IPs who, on more then one occasion had said, "Oh, by the way, tug and pull and check all your screens and gauges before the cat shot in case something is loose." Apparently, the screen was missing a setscrew, and I might have noticed it was loose with a little tug. One more trick of the trade to put in my bag of tricks.

Lt. Menza was with VAQ-129 at the time of this incident and currently flies with VAQ-140.



*By LCdr. William Miller*

As an exchange officer flying the Sea Lynx with the German Navy, I was looking for new and unusual experiences. Shortly after arriving at my new post, my expectations were more than met when I began the German version of water survival. The classes and pool drills were very similar to what I had experienced with the U.S. Navy, but when they started talking about throwing us over the side of a boat into the North Sea (yes, it was winter time), I started to hope I was translating incorrectly.

As we were trying on dry suits, I realized the Defense Language Institute training had not failed me, and I indeed was headed for a December dip in the North Sea. Needless to say, that afternoon's lecture on open-ocean and cold-water survival focused my attention and challenged my newly acquired language skills.

I had been in the water for fewer than 30 seconds but already hardly could move my hands.

# A Cool, New Experience

Too early the next morning, I walked through the snow and boarded a bus, which took us to the ship. Once on board, our class headed for the North Sea. As the sun rose and I ventured onto the fantail, I thought they probably would cancel the training because there was not only snow on the deck but also several dark and threatening clouds in our general direction of travel. When the ship stopped and we were told to grab our gear, I knew I was in for an exhilarating experience.

After a short review of my ditching procedures and quicker than you could say, "Noch ein Bier," I was in the water. The initial cold shock hit me hard; I was surprised by my shortness of breath. At first, I just floated in the water, thought about my predicament, and wondered how it would feel if I really had just ditched and was alone on the ocean. After my five seconds of philosophizing, the next thing I noticed was my rapid loss of manual dexterity. I deployed my raft and slid into it. I had been in the water for fewer than 30 seconds but already hardly could move my hands.

After trying to get some of the water out of my raft, my hands were just too cold to continue, and I had to stop bailing and try to warm them. My wet flight gloves only made the situation worse and blowing into my hands did not do enough. The one thing that allowed me to thaw out my hands was an inflatable set of mittens. Without these mittens, I would not have been able to even open the zipper on my survival vest, let alone try to work a flare or other signaling device. With my hands warmed by the inflatable gloves, I was able to regain dexterity and continued to deploy my sea anchor. I then donned an insulated hood, inflated the bottom and wind guards of my single-man raft, started to remove some of the water from the raft, and prepared my signaling devices. After completing these actions, I was able to think about my situation and again tried to imagine what it might be like under more stressful circumstances.

While I was floating and waiting for the rescue helicopter to pick me up, it started to snow. But with all the proper equipment, I was surprisingly comfortable. This let me think more clearly and make better decisions. The rescue helicopter eventually hoisted me up and quicker than you could say, "Jaegermeister," the crew gave me a shot of whiskey. I then was hoisted down to the ship and started to think about this impressive training exercise.

One of the first things I realized was how important survival equipment is in an open-

ocean or cold-water-survival situation. The most important piece of gear is a dry suit. Before my North Sea experience, I actively would try to find a weather guesser who would report a combination of air and water temperature that would allow me to avoid wearing the long underwear or, worse yet, the dry suit. Now, if I even am close to the established OPNAV 3710 limits, I wear the dry suit. Without it you only have minutes before being incapacitated by the cold.

The dry suit only works as intended when it is worn with the long underwear and thermal liner.

The German Navy had an unfortunate, yet poignant, example of this when a Tornado crew ejected over the North Sea. The RIO had his anti-exposure suit with all of the undergarments and survived. The pilot, who wore only the outer dry suit and not the required long underwear and liner, died of hypothermia. If the water temperature versus air temperature is even close, give yourself at least a decent chance of survival by wearing your survival equipment.

For passenger aircraft, when the aircrew are wearing dry suits, make sure your passengers are wearing the quick-donning assembly or the passenger-assembly anti-exposure suit.

I found the inflatable mittens and the hood to be indispensable. This experience convinced me that the mittens are a key part of cold-water-survival gear. Your hands are critical if you want to survive in cold water. Not only are your hands necessary for the use of signaling devices, but it also is difficult to concentrate on other tasks when they are stinging from the biting cold water. Make sure your dry suit has the anti-exposure mittens and hood assembly stowed in one of the leg pockets.

Getting out of the water and into a raft is the next critical element in cold-water survival. The single-man raft I used in the North Sea was the best design I have seen. It looked the same as the ones we use in water survival with the U.S. Navy, but you can inflate the bottom of the raft as well as the windshields for additional insulation from the cold. Protection from the wind is very important, especially when you are wet. I recommend this improved type of raft be acquired and used in the U.S. Navy.

For aircrew who do not have rafts physically attached for egress, make sure your crew knows how important these rafts are in case of a cold-water-ditching scenario. Think about and brief what could be done to make sure the rafts get out of the aircraft. Do not allow rafts to get packed away under cargo or in areas that are not quickly accessible. Also, the rafts will get filled with water when a survivor slides aboard. It is important to stay as dry as possible, so work to get the water out of the raft. The sides of the wind shield can be used to empty water. By submerging the edges of the wind shield into the water in the raft and then pulling up and out, the water will be forced to roll down the outside of the raft.

Here are other helpful tips to remember: Constantly work to collect fresh water. Good sources of water include rain or, in my case, snow, bluish sea ice, and any moisture that might form on your raft or equipment. Store as much water as you possibly can because you never know when you will have the chance to renew your supply. Do not drink urine; not only is it really gross, but it will increase your overall rate of dehydration. Do not eat unless you have water available to aid digestion because you will only dehydrate yourself more. While waiting for rescue and to assist in warming yourself, attempt to stretch and do small, controlled callisthenic movements, such as waving your arms or twisting your torso. Be careful not to sweat because you want to control your expenditure of fluids.

My chilling dip in the North Sea was not exactly one of the experiences I expected on my exchange tour, but I am glad to have done it. It taught me some lessons, which were forever "frozen" into my mind. As we rode the ship back to port, someone in our class told me we had been given this great training opportunity and would be fortunate to repeat it yearly. The Germans go through sea survival every year. And, since I started in early winter, I probably would continue to attend each winter. With that frigid thought, and before you could say, "Hefeweissen," I quickly ordered a pilsner from the ship's bar and was able to find some consolation in my prospect for new experiences.

LCdr. Miller flies with HS-3

# Mishap-Free Milestones

VMFA-232
22 years (90,000 hours)

VMGR-252
(375,000 hours)

VPU-1
19 years (37,823 hours)

HC-3
27 years (170,000 hours)

VFA-27
15 years (60,000)

VAW-126
9 years (13,900 hours)

4th MAW
5 years (633,435 hours)

VP-26
39 years (284,500 hours)

VFA-137
16 years (60,000 hours)

VAW-121
35 years (67,650 hours)

VFA-94
10 years (43,000 hours)

VFA-97
7 years

VR-61
19 years (75,000 hours)

USS *Enterprise* completed 10,000 mishap-free traps on its 18th deployment.

# Aviation Humor

Gripes Worth Griping About

Here are some actual maintenance complaints submitted by pilots and the replies from the maintenance crews.
■ = problem; ■ = solution

■ Left inside main tire almost needs replacement
■ Almost replaced left inside main tire

■ Test flight OK, except autoland very rough
■ Autoland not installed on this aircraft

■ No.2 propeller seeping prop fluid
■ No.2 propeller seepage normal - Numbers 1, 3 and 4 propellers lack normal seepage

■ Something loose in cockpit
■ Something tightened in cockpit

■ Evidence of leak on right main-landing gear
■ Evidence removed

■ DME volume unbelievably loud
■ Volume set to more believable level

■ Dead bugs on windshield
■ Live bugs on order

■ Autopilot in altitude-hold mode produces a 200-fpm descent
■ Cannot reproduce problem on ground

■ IFF inoperative
■ IFF always inoperative in OFF mode

■ Friction locks cause throttle levers to stick
■ That's what they're there for

■ No. 3 engine missing
■ Engine found on right wing after brief search

■ Aircraft handles funny
■ Aircraft warned to straighten up, fly right and be serious

■ Target radar hums
■ Reprogrammed target radar with the lyrics

# My Scariest M

"Understand you lost your No. 1 engine?" "Uh, we lost our only engine."


# oment

*By Lt. Andy Bordick*

I used to tell people the scariest things I've ever done were night traps in the Tomcat. I can't say that anymore.

My T-45 student (callsign Flash) and I were "stuck" in Key West. We were supposed to swap a good jet for a high-time jet and do student airnav training en route. A low-pressure system was sitting over southern Florida, and the weather delayed our departure for two days. Although upset, we sucked it up for the team. You know how bad Key West can be.

On Monday morning our wallets were thinning and the weather appeared to lighten up. A sigmet was building on the west coast of southern Florida, so we planned to skirt it to the east. Just as we were about to file, the area the sigmet covered increased, but our route still took us to the east of it.

We launched and went IMC at about 10,000 feet. We were climbing through the 20s when Miami Center asked us about our route. We said we wanted to avoid the weather (big, ugly sigmet…duh). The controller told us he had a "hole" that was more direct to our destination, with a couple of reports of a smooth ride at FL370. It sounded like a suitable shortcut, and I thought that Flash might benefit from some route changes. We actually broke out in a little hole while transiting the high 20s. This would be the last time we would be VMC for a while.

We were in a steady, albeit slow, MRT climb, passing FL380 for FL390. The clouds were thinning; in fact, we thought we would break out when we leveled off. We were in smooth air and climbed at a fuel flow of around 1,300 pph.

A lightning bolt came from the right but didn't appear all that powerful. It struck the bottom of the aircraft forward of the wings. We heard a slight ding, like someone had hit us with a pebble or small rock, then the engine spooled down.

The rpm and EGT were in a steady decline, while the fuel flow was reading somewhere around 4,500 pph. Numerous warning and caution lights began to illuminate (all those that would come on during a normal shutdown). I took the controls and pushed the nose a little bit, so we wouldn't get too slow. I declared an emergency, while dialing in 7700, because I knew we

would be crossing a few flight levels we weren't cleared to cross. I began an immediate airstart, which consists of securing the throttle, pushing the GTS (APU) start button on the throttle, and bringing it back to idle. Center was quiet as we starting descending, which was a good thing because, suddenly, I couldn't breathe. I had been used to flying with LOX, so it didn't hit me that I needed to circumvent the OBOGS system with that green apple. Well, that was no easy task as the loop was hiding under my left thigh. At the same time I pulled it, our cabin pressure was indicating over 25,000 feet, so taking the mask off was not an option unless we wanted to go immediately hypoxic. I started breathing just as Flash confirmed we had both pulled the ring. We then noticed the EGT was spiking. I secured the throttle and was watching the airspeed increase to nearly 300 knots. Did I mention we were still IMC?

Having been distracted by those other duties, I just tried to pull a little. It didn't help. I looked at my standby gyro, and it showed a slight wing down, so I leveled the wings and pulled, still accelerating. Flash then said I was left-wing down and severe-nose down. I pulled harder to no avail. Finally, he said, "Cosmo, you are 60-degrees left-wing down and 30-degrees nose low." Well, my gyro showed level wings and 20-degrees nose up. So I (yikes!) gave my student the controls. By the way, the main attitude indicator was inoperative on the batteries. We were single-radio, pitot-static and (single) standby-gyro glider guys.

Flash astutely leveled the wings and started to break our rate of descent. I tried another immediate airstart, hoping the 330 knots indicated would help the motor. No joy. The engine was hitting its airstart limit of 600 degrees at 18 percent rpm. There is a caveat that we get 10 seconds at temperatures up to 650 degrees, but it didn't appear we would hit idle rpm in that time. Did I mention we were still IMC?

We checked the wet compass, and it showed a westerly heading. I checked the Garmin handheld GPS on my knee, and it was tracking the same, around 290 degrees. I hooked the nearest field, which was Southwest Florida International Airport in Ft. Myers. It has a hard surface of greater than 5,000 feet, so we put it on the nose.

We told Center we were heading direct. They came back with questions like, "Understand you lost your No. 1 engine?"

To which we responded with a snappy, "Uh…we lost our only engine."

This prompted an immediate, "Standby" call that momentarily silenced him. With a steer from the GPS, we proceeded north to Ft. Myers. Flash was doing his best to keep us gliding and heading the way we wanted to go. Although I had a good heading to get to the airfield, he had only a wobbly wet compass to follow, so I gave him some, "Come left or right" calls. He was keeping the speed around 230 knots, looking to intercept around 200 to max our glide.

We were switched-up to Ft. Myers approach, and I was breaking out the PCL to look for other options. I again tried the assisted airstart procedure that should have engaged the starting unit, but it didn't increase our rpm. After a few failed airstart attempts, I went to the failure-to-relight procedures, which said we needed to wait for 30 seconds before another attempt, while checking switch settings. Ft. Myers started asking us questions like, "Souls on board? Homefield information," questions I didn't like to answer. They also tried to vector us for the final portion of the VOR/DME for runway 24, which I quickly squashed with a reply that we needed direct. So they tried to give us headings, for which I informed them we were wet compass only. They obliged all our requests and started vectoring us direct to the field with clock codes and distances to the field. They also told us the weather was 1,200-feet overcast with 2 miles visibility.

After waiting for what seemed an eternity, I tried another engine start with the same results. We were showing fuel going in and the EGT lighting up, but the rpm was hanging below 20 percent. We were passing 10,000 feet and approach told us we were 20 miles from the field. I didn't break out the max-glide distances, but I was sure we couldn't get there from here. Did I mention that we were still IMC?

We tried a few more airstarts with similar bad results. I twice already had considered ejecting. First was when my standby gyro failed and we were accelerating to Mother Earth. Now, passing 10,000 feet, IMC, engine out, unable to

glide to the field, I again considered it. My mind kept saying, "I can't believe I have to eject from this airplane." Then the little voice said, "Don't give up; we're not done yet."

Passing 2,500 feet (barometric altitude, because the radalt doesn't work on the batteries), we noticed it looked dark beneath us. We were around 8 miles from the field. Approaching 2,000 feet, I told Flash it was time to let the engine cook because we were running out of options. We started to break out

Lt. Andy Bordick and 1stLt. Gary Shill moments after landing.

and I began riding the stick. We were being told where the field was, but visibility was poor. We had ground contact but couldn't see the airfield.

Right about the time I saw the runway, I felt a little kick in the pants. I looked at the rpm. It was climbing through 50 percent, and the EGT was decreasing through 600 degrees. I took the controls, dropped the gear and flaps, and performed a modified precautionary approach to a Grumman hard landing. We reset the generator and hydraulics on short final, so by the end of our rollout, all of our warning and caution lights were out. We taxied to the FBO, while answering many questions from approach and tower. We shut down the jet, which now appeared to be operating 4.0.

They don't know why the engine spooled down after the lightning strike. Rolls-Royce still is investigating "disrupted airflow" theories. The NATOPS manual states you can expect "higher than normal temperatures" on high-altitude airstarts. But seven failed airstarts and a successful one finally taught me just how high those temps might be. We were IMC for 36,000 feet, which took approximately 15 minutes to cover as a T-45 glider, but the time went by like it was 15 seconds. After the episode of passing the controls to my student, I was panicked. I had been in system failures in aircraft before and was never as scared as I was during this incident. The reason I admit that is because it affected my thinking and problem-solving ability.

Flash and I never discussed an ejection plan. He later told me he was going to hang on for another 10 seconds…maybe. Flash never knew I had the PCL on my knee and was following it. Nor did he know I had tried seven unsuccessful airstarts on the descent. He was watching the EGT on a couple, but I didn't tell him every time I was trying a new start.

We made many mistakes that day, most of which rest solely on my shoulders. Even though Flash didn't have many hours in the jet, he spoke up to let me know I was doing it wrong. Had it not been for his level-headedness during an extremely tense situation, this would be a story about our ejection. Without the handheld GPS I had used extensively for two cruises, we never would have found a suitable landing field.

Some people would say we were unlucky because we got hit by lightning, and it knocked out our engine. I say I am lucky because enough things fell our way to get that airplane safely on deck with no injuries. In fact, the engine wasn't even damaged. Plus, I now have a new "scariest moment" story.

Lt. Bordick flies with VT-21.

# MC1 Failure?

# No Problem!

Cockpit photo by Matthew J. Thomas
Photo-composite by Allan Amen

*By Lt. Oscar Montes*

It was a good deal OCA, a short 1+15 cycle with 2,000 pounds of gas per blue fighter, and with a mixed division of Hornets and Tomcats as red-air. It was our first flight since a sweet port visit to Singapore, and we were licking our chops to fly this hop. I made a mental note to work slow, methodical CV ops—I wasn't the only rusty person on the flight deck after the in-port period.

Right off the cat shot, my displays flashed in a weird flicker. After the clearing turn, I leveled off at 500 feet and took a moment to analyze the situation. It looked like an MC1 failure. Yep, it was. No big deal, I thought, and headed out 10 miles and climbed to 10,000 feet to meet the tanker. After making sure both of my external tanks were transferring, I set the switches to stop, to keep the drop tanks from transferring. I wanted the fuel from the S-3 going straight into my internal tanks. That way, I'd save a couple hundred pounds and a little time.

It was a quick climb and rendezvous with the tanker at altitude. I considered radioing my flight lead about my system malfunction, but he was on the tanker, so I waited until we headed out to CAP. After a short bout with the basket, I crossed

under to the outside of the formation and thought about my problem. MC1 failure—that's the NAV computer, so I could expect to have no waypoint information and a degraded HSI for navigation. I still had a TACAN, and the sky was clear. I wouldn't have any problem finding the ship or my emergency divert field.

My thoughts were interrupted as the division completed tanking, and we turned to CAP. All thoughts of the malfunction took back seat to basic aviation. We simply were staying in formation as we went through item checks, executed our G-warm, and fenced in.

"Cobra one two fenced in, MC1 failure. I have no waypoints, so I'll need BRAA calls for control." That was my first call to the outside world about a malfunction.

My lead rogered the call. He thought I had it suitcased. I certainly sounded like I had it under control. We pressed out for the first run.

It was an awesome fight. The red-air presentation was aggressive, and we responded in kind. MC1 notwithstanding, I was getting great training and having a bit of fun, though I had to fight some gremlins in the radar. Still, we managed to splash every bandit, with no blue fighters lost.

The MC1 failure was out of my mind completely and out of my scan. It was a mere inconvenience I might have to think about on the RTB. On the way back to CAP, lead initiated a fuel check—we were fat. I still had 10,000 pounds. The next run was even more challenging than the first. My radar acted up, the bandits were wily, and, as I turned hard left at the merge with a Tomcat, I found myself contending with a squirrelly jet.

In a 400-knot, 7-G, nose-low, slicing turn, the jet tried to roll right toward the horizon. I lowered my G while continuing an easy turn, then saw the Tomcat coming nose on. I popped some flares and again programmed the stick back to a 7-G turn. The right wing kept dropping off. As I prepared to call "Terminate," my lead called, "Fox two, kill Tomcat, left-hand turn." We knocked off and headed back to CAP.

I swept my eyes around the cockpit, feeling like something definitely was not right. I looked to the right at my warning-lights panel. There it was—a low-fuel light. I then noticed my total fuel was up at 7,000 pounds, well above ladder, but my internal fuel was a mere 2,500 pounds. I glanced at the DDI for any warnings and cautions—nothing there but the MC1 failure. What in the world?

I realized my external tanks were off. I put the switches in the normal position and prayed the transfer would work. It did, but I was rattled. Why hadn't I gotten a bingo caution or a low-fuel aural warning? Then it dawned on me: The most significant effect of an MC1 failure is the loss of all aural tones and nearly all DDI warnings and cautions, including the bingo aural warning and the low-fuel warning.

I had started earning my paycheck, so I broke out the PCL for the first time. There it was in black and white. How had I been so foolish? After I got back on deck, I analyzed the situation. I had made several mistakes that could have led to an airborne flameout. First, and most importantly, I had failed to accurately assess the effect of my MC1 failure. Second, a misplaced sense of mission accomplishment had led me to blow off the PCL and my other information assets (such as flight lead) on my way to the tanker. Third, my cockpit scan was lacking. I hadn't thoroughly checked my fuel state on several fuel checks, relying on the bingo bug to remind me to transfer my external tanks. Overall, my habit patterns needed some work.

If the gas remaining on the external wing tank hadn't altered the jet's handling characteristics during my fight with the Tomcats, I never would have figured it out. My first indication would have been the sound of an engine spooling down. Would I have had time to transfer the fuel? Would I have remembered I had gas trapped in the external tanks? Probably.

Lt. Montes flies with VFA-97.

By LCdr. Don Pagel

# A Lesson in Teamwork

It was a typical Florida summer morning at NAS North Whiting Field—clear skies and unrestricted visibility. We were a formation flight of two that began with a brief on relative-motion techniques and formation procedures. Our view of the mission was positive, the instructors were experienced, and the students were as eager as the sky was blue. Little did we know our lesson of the day would not be in section parade but in resource management and teamwork.

After taxi and run-up, flight lead reported outbound to squadron operations, where a senior-standardization pilot stood flight-duty officer (FDO). The winds were from the west as our section of two T-34Cs took off on runway 32.

When the lead pilot retracted his landing gear, a bolt linking the left inboard-gear door and left main-gear downlock sheared because of stress fatigue. The left inboard-gear door hung open on its hinge, with the landing gear in its uplocks. Our wingman, the designated section leader and senior formation-standardization pilot, advised us of the protruding door via our discrete air-to-air VHF frequency at the same time our inboard gear-

Photo by Matthew J. Thomas
Photo-composite by Allan Amen

door light illuminated in the cockpit. The lead aircraft coordinated a climb with the tower controller to hold over the airport at 2,500 feet. We resisted the temptation to delve into the systems, and instead, concentrated on flying the aircraft to the emergency-orbit pattern. Once established, I passed the controls to a calm and collected student copilot.

We followed the procedures for the inboard gear-door light and landing-gear inspection. An airborne check showed damage to the left main-gear downlock as well as the inboard-gear door. Realizing this was a compound malfunction and not specifically addressed in the flight manual, the wingman suggested manually extending the landing gear extension, instead of using the normal electrical method the NATOPS procedure directs. When the copilot hand-cranked down the gear and disclosed an unsafe-down indication, we realized it would be a long day. Our wingman confirmed the unsafe left mainmount.

With time on our side, we decided to take advantage of the experienced FDO and notified the chain of command of the ensuing unsafe-gear landing on UHF. We kept the tower informed on the VHF frequency, but they also monitored our UHF squadron frequency, allowing them to listen to the maintenance discussions. The flight read through the unsafe-landing-gear checklist. The FDO assembled a troubleshooting team of instructors and had the airframe and quality assurance shops on the phone. Before throwing any switches, we consulted with the professionals on the ground.

The wingman described the visible damage, while lead relayed the cockpit indications. The airframe technicians concluded that the fore-and-aft braces were down and locked and advocated a gear-down landing. They felt there was a high probability of a successful rollout as long as side loads were minimized. The instructors agreed, which boosted our confidence. I elected to leave the gear in its present condition and land using the unsafe-main-gear checklist. The tiger team of instructors and maintenance personnel evaluated each step of the emergency procedure to determine how it applied to the existing damage. With time still on our side and 2+30 hours of fuel to burn before landing, our risk management discussion continued: over-full flap or no flap, engine or no engine, electrical power or not, and crosswind considerations for side-loading effects.

I told the tower our intention to land at NAS South Whiting Field, our landing time, and our estimated fuel remaining. The north-tower controllers gave this information to the emergency fire, rescue and medical personnel, and coordinated the handoff with south tower.

As the pieces fell into place perfectly below us, we noticed the morning crosswinds increasing and assessed the risk of landing with greater side loads or less fuel. Runways 23 and 32 were available and both were 6,000 feet in length. The winds varied from 270 to 290 degrees, at 10 knots. Side loads would adversely affect the left-main gear. After weighing the crosswind effects on touchdown versus landing rollout, and then practicing approaches to each runway, we elected to use runway 23.

Practice approaches in the actual landing configuration were essential. The procedure prepares the crew for evacuation after landing by opening the canopy, requiring the use of oxygen masks, and securing the engine after touchdown. We simulated the latter by having the copilot touch the fuel-control switch when directed. The high humidity of the gulf-coast air initially obscured all glass gauges, but they cleared by the second practice run, when the cockpit temperature had equalized with the morning heat.

As the winds grew stronger, we decided it was time to test our theory and requested a full-stop landing. As practiced at flare altitude, the copilot secured the engine. The aircraft accelerated as the propeller feathered and floated in ground effect for 2,000 feet. The plane touched down on the right side of the runway (the good main-gear side) but, to our surprise, maintained a 60-knot groundspeed. We applied symmetrical braking to decelerate but also to avoid side loading.

The aircraft stopped on all three wheels with 500 feet of runway remaining. The crash crew pinned the main-landing gear, and we returned to maintenance control to fill out the paperwork. The aircraft returned to service in two days.

I want to focus attention on the people behind the scenes. As a customer that day, I received total professional support from my shipmates. I could not have picked a better team. Aircrew-coordination-training skills were apparent in the air and on the ground. Our two students got a lesson in resource management and teamwork, which they will depend on in the fleet.

LCdr. Pagel is a reservist with VT-2.

# Running Down th

By Lt. Dave Brooks

It was night, and I had just dropped my wingman off in the marshal stack after another max-endurance session of AIC. I then heard the master-caution tone and saw the master-caution light illuminate on the instrument panel. Looking at the left DDI, I then saw the hyd 2A, FCS, and flaps-off cautions staring back at me.

The Hornet's hydraulic system is divided into two sides: Hyd 1 is driven by the left engine, and hyd 2 by the right engine. These are further split into two circuits, each of which owns or shares responsibilities for actuating flight controls and (hyd 2 only) operating other hydraulic components. In the case of flight controls, switching-valves allow hydraulic pressure from the functioning side to take over if you lose an engine. However, this is not the case for non-flight-control actuators, such as landing gear. Hyd 2A is the circuit responsible for operating the landing gear and the refueling probe. These items are extended by using hydraulic accumulators.

A look at the FCS page verified my suspicion: X's in both channels (2 and 3) of the right leading-edge flaps (LEFs). The flaps were stuck at approximately 7-degrees down. NATOPS states that in the case of a hyd 2A failure, combined with a right LEF failure, a reset of the FCS should not be attempted. In other words, I was stuck with the flaps as they were. After discussing the situation with my rep in CATCC, I followed the conga line down via radar vectors toward the final bearing. Approaching 15 miles, I used pressure from the APU and brake accumulators to emergency-extend the gear. All three indicated down and locked within 15 seconds. After recharging both accumulators with the HYD ISOL ORIDE switch, I emergency-extended the refueling probe.

With the right LEF frozen at 7 degrees, NATOPS calls for a half-flap approach not to exceed 7 degrees AOA. This minimizes the effects of the split-flap condition. This creates a flatter-than-normal approach attitude, and, what I thought was a little-high pass actually resulted in a bolter on the first attempt.

Although I was well above dirty bingo numbers, I was directed to tank. Unfortunately, the tankers had been instructed to head to the nearest divert field during any recovery tanking. Since North Island was off the bow at 140 miles, I found myself whipping the ponies with gear and flaps down, attempting to run down the S-3 (a new experience). I did not realize I had selected flaps AUTO, which means the flaps will not return to AUTO from HALF or FULL unless GAIN ORIDE is selected. This means I was in a less than ideal configuration for saving fuel as I ran down the tanker. After several requests for the tanker to turn, I was able to join and take my 2,000 pounds of JP-5. Tanking dirty, with split flaps, was a new experience for me. The aircraft was a bit more squirrely, but it was not especially hard to get into or stay in the basket.

Because we had been flying away from the ship the entire time, I now had to backtrack nearly 30 miles, all the while burning what fuel I had received. When I got back on the ball, I was at the exact fuel state I would have been had I simply gone around in the bolter pattern. Using the lessons learned (by me and paddles) from the previous attempts, I flew a successful pass, let-

# e Tanker

ting the ball sag ever-so-slightly crossing the ramp for an OK 3-wire.

The postflight inspection revealed a cracked hydraulic line in the port wheelwell that had depleted circuit pressure. The first lesson learned was actually

> Approaching 15 miles, I used pressure from the APU and brake accumulators to emergency-extend the gear.

one re-learned: 90 percent of the time when something goes wrong, it's a pitch-black night behind the boat and 100 miles from land. The second lesson had to do with handling qualities and the effects of a flatter attitude during a low-AOA, split-flap approach. Finally, a little postflight study taught me to consider fuel conservation when using GAIN ORIDE while tanking, which I should already have known. It's nice to have a rep backing you up in CATCC, but his digging through the big book is no substitute for the basic systems knowledge you need each time you walk to the jet.

Lt. Brooks flies with VFA-115.

FA-18 photo by Matthew J. Thomas
Photo-composite by Patricia Eaton

# ORM Corner

# Near-Midairs With a Train

*By LCdr. Ron Dennis*

This promised to be another mundane work-up flight. We knew where all the players were supposed to be and when they were supposed to be there. OK, maybe we were getting a bit relaxed, but we'd been doing the same ol' thing for two weeks. We felt it was time to move on to something more challenging. Circumstances were about to provide it.

We launched on time and headed to station. As we leveled off at FL190 and pressed westward, the coastal lights didn't look right. We seemed mighty close to the beach. All of our nav systems were acting up, so we turned north to parallel the coast. We cross-checked the outline of the coast with the nav chart. Sure enough, we were nowhere near where we were supposed to be, and far too close to the coast. (It doesn't take long when you launch only 65 miles off the coast in the first place, and your station is to the west.)

The nav was really out to lunch! We turned toward the horizon-less eastern sky to remain in the warning area. While I wrestled with the charts and the nav system in the right seat, my seasoned, first-tour pilot wrestled the aircraft and

F-15E and KC-135R. USAF Photo by SSgt. Andy Dunaway. Photo-composite by Allan Amen

E2-C Photo by Matthew Thomas

The pilot slammed the throttles forward and pulled back on the yoke, as I yelled, "Climb, climb, climb!"

his vertigo in the left. I looked up from the chart to scan outside (probably the first good thing I'd done so far that flight) and saw a train of lights off to the northeast moving toward the west. Just as I foolishly said, "What is that? It looks like a train," the train turned south, directly toward us.

The mission commander, in the back, assured me nothing was on his scope at our 10 o'clock for five miles. But there was no mistaking the set of lights heading our way. Both of us up front realized about the same instant that these lights came from the scheduled big-wing tanker with her chicks in tow. It was co-altitude with us at about a mile and a half. The pilot slammed the throttles forward and pulled back on the yoke, as I yelled, "Climb, climb, climb!"

We passed fewer than 500 feet above the tanker package. They never saw us. Again, the mission commander assured me, "There's nothing there!" The radar obviously was out to lunch as well.

We were dumbfounded. We knew the tanker was supposed to be northwest of the ship, but they weren't supposed to be this far to the northwest; they were supposed to be at FL200, not FL190. In hindsight, being 1,000 feet below the briefed tanker altitude wasn't smart since the receivers usually rendezvous 1,000 feet below the tanker before moving into refueling position.

We leveled at FL200, regained our composure, and pressed southeast toward our real station. Less than five minutes later, we noticed the train of lights again, this time off to our right, and again coming toward us. I wasn't too concerned this time since I knew they were at FL190, and we were at FL200. However, as the train drew closer, a dreadful feeling began to creep up from the pit of my stomach. Deja vu. At about a mile and a half, I screamed, "Climb, climb, climb!" for the second time. The blasted tanker had climbed a thousand feet. This time, we passed close enough to see into the cockpits of the trailing chicks, all six of them. Again, they never saw us.

Assumptions and complacency nearly had killed us twice in one night. The E-2C weapon system is very good at detecting air targets, but it's not perfect. Pilots rely on the extra set of eyes in the back of our aircraft, but sometimes those eyes are blind. The necessity to see and avoid was driven into our heads that flight.

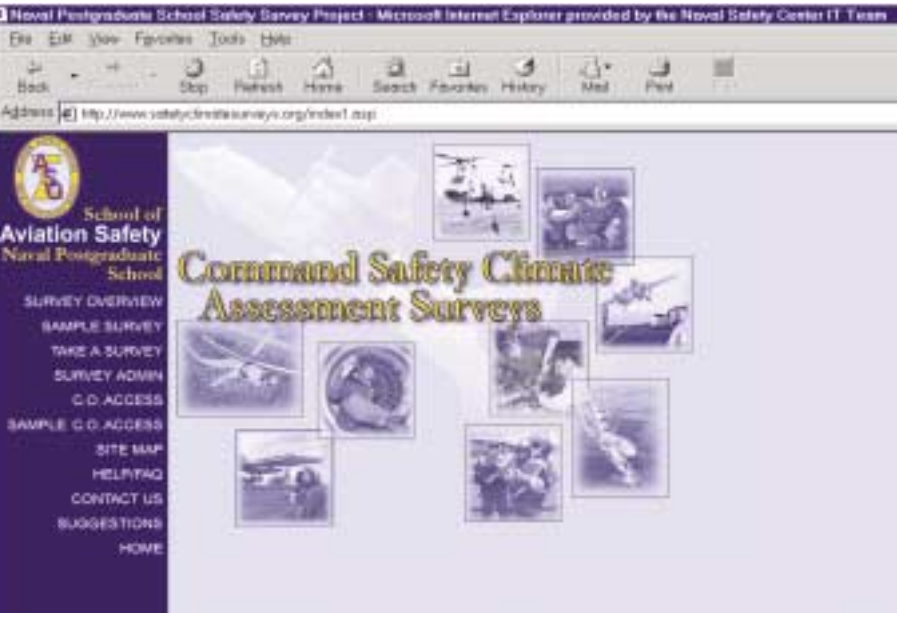
Have a plan, and don't let yourself stall on the tracks in front of a speeding train. You might get blindsided.

LCdr. Dennis flies with VAW-124.

# Taking the "SAFETY PULSE" Of Your Squadron

*By Dr. Robert Figlock and Dr. Anthony Ciavarelli*

The CO has been in place for a couple of months and is getting a grip on the squadron's op tempo, work ethic, and safety climate. But, are the CO's impressions correct? Is the CO's finger on the pulse of the squadron? How can COs know when their perceptions are accurate? How do they gauge success of current, well-established programs within their units? Gut feeling? Intuition? While these may play a role, most COs rely on more traditional approaches, such as staff feedback, performance measures, personal observations, and now, Command Safety Climate Assessment (CSCA) Surveys. The CSCA process is a new, web-based tool for COs to survey the perceptions of their aircrews and maintainers and access feedback. To date, over 24,000 surveys have been submitted by more than 270 aviation units.




Via this home page, more than 24,000 personnel from 270 squadrons have participated in the surveys.

These surveys are one of the newest tools in the continued efforts to reduce the naval aviation Class A flight mishap rate. It has declined markedly over the past fifty years, but the proportion of mishaps due to human error has remained at a stable 80 percent. Over this period, many intervention efforts addressed crew-station design, operational training, and aircrew selection. Unfortunately, little attention was paid to organizational factors that affect safety performance.

That changed following the F-14 crash near Nashville in 1996. Senior naval-aviation leaders chartered a human factors quality management board (QMB) to analyze processes, programs,

and systems. The QMB focused on analyzing mishap data, benchmarking best practices, and assessing safety climate.

QMB support led the Naval Postgraduate School (NPS) to study squadron organizational safety. UC Berkley had already researched high-reliability organizations, identifying attributes that reduce risk in hazardous operations. Since such attributes are difficult to observe and measure, the NPS developed a model that was tailored to aviation squadrons. The model included: process auditing, reward systems, quality control, risk management, command and control, and communication and functional relationships. This model became the basis for the CSCA surveys.

### CSCA Surveys

The CSCA on-line surveys are the Command Safety Assessment (CSA) aimed at aircrews, and the Maintenance Climate Assessment Survey (MCAS) aimed at maintainers. These surveys are available via the NPS School of Aviation Safety website. The surveys assess an organization's ability to conduct flights and maintenance in terms of leadership, culture, standards, policies, procedures, and practices. Each survey takes approximately 15 minutes to complete.

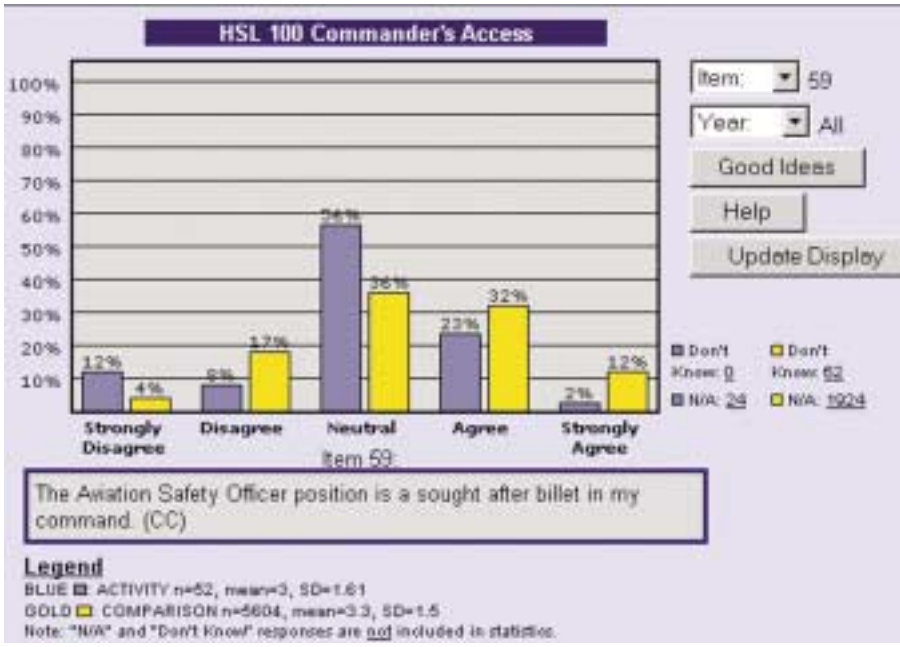
### Privacy of Data

Participants remain anonymous. This permits their unbiased inputs to reach the CO without fear of retribution. Squadron survey results are available only to COs, on the web via password. Unit results are combined with those from other organizations to form a database. It allows COs to compare their unit by such categories as aircraft type and community. Access to individual command results is restricted to unit COs. Only compiled survey results for aircraft type or community are available to group, wing, and type commanders. COs can use the responses to adjust their perceptions and to be proactive in their squadrons. Similarly, upper-echelon commanders can make adjustments to provide broader support on community-wide issues.

### Sample CSA Survey Results

A sample CSA question is, "The Aviation Safety Officer position is a sought after billet in my command." The image below shows how it would be viewed using the CO-access option. This view compares the unit's data (the blue bars, 60 responses) to the entire CSA database (gold bars, 4,904 responses). After comparing the two response distributions, they appear to be a "reverse image" of each other. Results like this will raise questions in a CO's mind as to why the squadron


Pull-down menus allow you to complete the survey in 15 minutes.



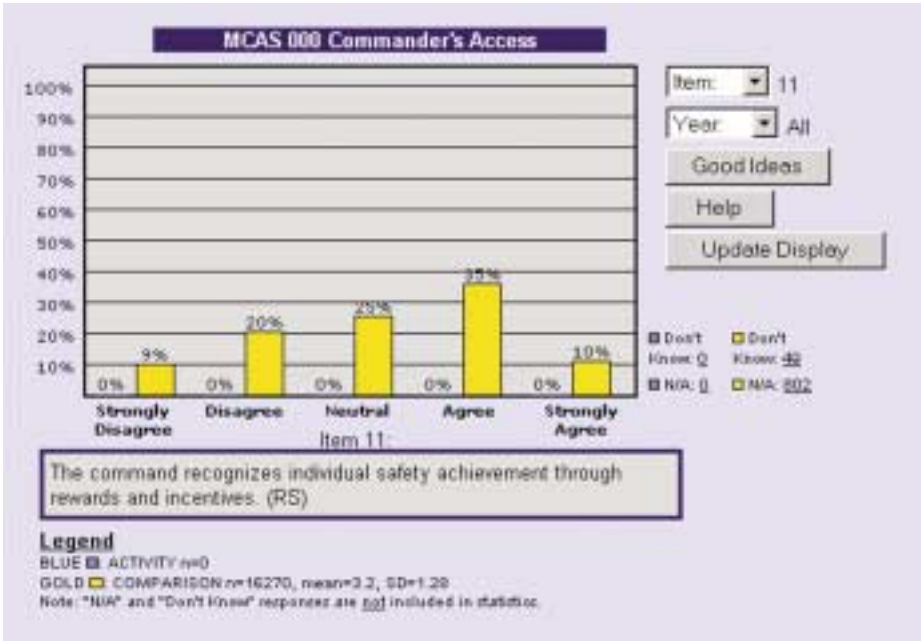

Here's how you can display squadron-survey data for a specific question.

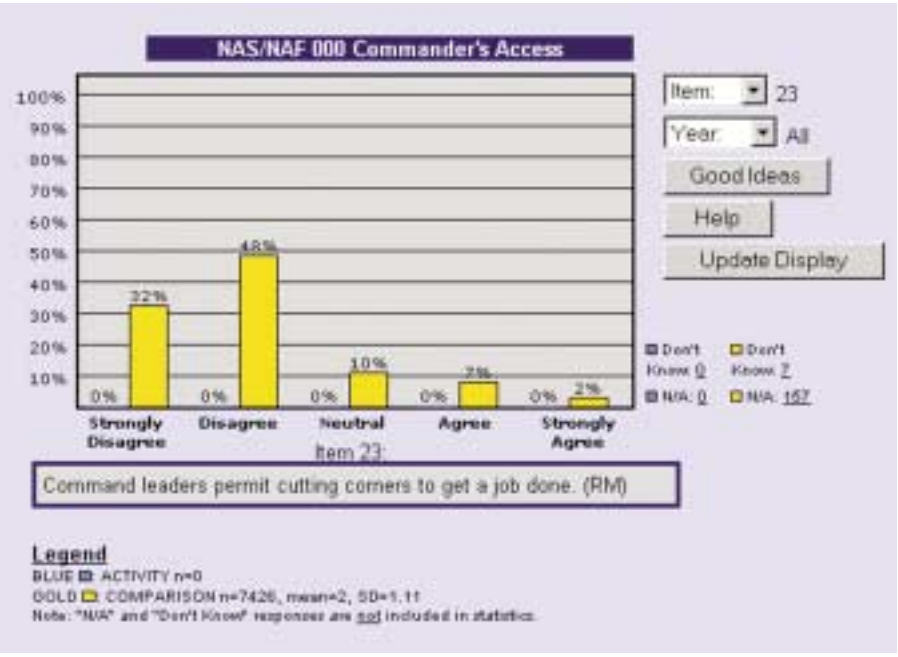
data differs from the aggregate database. Reviewing other survey items relating to the squadron's safety department may provide further insight.

### Higher-Headquarter Access to Survey Data

Higher-headquarter (HHQ) COs also can access the aggregate database for comparing aircraft types and communities. The image below shows sample CSA data for item No. 23, "Command leaders permit cutting corners to get a job done," as it would be viewed using the CO-access option. Note this item is negatively worded, so disagreement is desirable. The view is for all aircraft categories, which includes the entire database. Should naval-aviation COs be satisfied that nearly a fifth of the aircrew finds command leaders permit corner-cutting? Results like these raise a question in a group or wing CO's mind, "How are my squadron COs communicating their safety message?"

Sample MCAS data is shown below for item No. 11, "The command recognizes individual safety achievement through rewards or incentives," as it would be viewed using the CO-access option. This is for all aircraft categories. It shows that fewer than half of the responding maintainers found the reward system to be in place to recognize safety achievement. This is an area where a CO has complete control. Results like these may have a wing or group COs ask, "Should my COs provide greater recognition for safety efforts?" The CSCA surveys help identify problem areas. Although they don't provide the "why," they clearly provide a starting point.




You can also display information from a larger database. This one show corner-cutting views within aircraft types and communities.

The MCAS data can show if the rewards and incentives program is effective.

### Preliminary CSA Results

Here are some overall highlights from over 6,800 naval aviators, naval flight officers, and naval aircrew inputs in the aggregate aircrew database:

• 95 percent of CSA survey participants agreed that rules were important: "Leaders in my command encourage everyone to be safety-conscious and to follow the rules."

• Only 80 percent of CSA survey participants agreed that crew-rest standards were enforced in their command.

• 35 percent of CSA survey participants felt that, based upon their command's personnel and other assets, their command is over-committed.

• Only 73 percent of CSA survey participants agreed that good communication flow exists up and down the chain of command.

• Surprisingly, 27 percent of CSA survey participants responded N/A to this statement: "Human Factors Councils have been successful in identifying aircrew members who pose a risk to safety."

### Coming Soon!

The NPS School of Aviation Safety is putting the finishing touches on the next-generation CSCA system. You will be able to automatically update the database for different demographics or changes to the questionaire. Statistical profile analyses will be based on select "safety critical" questions or a commander's preferred questions. It will have more comprehensive statistical and graphic analysis routines for results and trends. Also, a new version of the MCAS comes on-line in early 2002. It was designed for the Naval Aviation Depot, Cherry Point, and focuses on depot-level maintainer issues.

### Requesting CSCA Surveys

COs wanting their units to take the CSA and MCAS survey, or both, should have their safety officer contact Professor Bob Figlock at rfiglock@nps.navy.mil, (831) 656-2581 (DSN 878). The safety officer supervises the unit-survey process and must identify how many aircrew and maintainers will be taking the surveys. Once a set number of surveys are submitted (60 percent recommended), the CO gets a password to access the unit's results on-line and compare them by category. HHQ COs also should contact Professor Figlock to gain access to the aggregate database. Additional information on the CSCA surveys can be obtained at www.safetyclimatesurveys.org or www.nps.navy.mil/~avsafety/.

Professors Figlock (USMC, Ret.) and Ciavarelli have been instructors for the past 10 years in the School of Aviation Safety at the Naval Postgraduate School, Monterey, Calif.

## About the School of Aviation Safety

The Navy established the school in 1965 at NPS in Monterey, Calif. Its charter is to, "Preserve human and material assets and enhance combat readiness by educating aviation officers to identify hazards, to manage risks, and to investigate and report hazards and aviation mishaps." The school offers two highly focused courses. First, a six-day survey Aviation Safety Command (ASC) course for aviation-squadron COs, XOs, officers screened for command, OinCs, and major-command aviation-safety staff officers. Second, a six-week, in-depth Aviation Safety Officer (ASO) course. The ASC course qualifies graduates for senior membership on an aircraft-mishap board, whereas the latter educates specialized ASOs to assist COs in conducting mishap-prevention programs. ASO-course graduates are taught to investigate aviation mishaps, organize and administer squadron mishap-prevention programs, identify hazards, and manage safety information. It is also noteworthy to point out that both Navy and Marine Corps ASO and ASC graduates are designated as ORM instructors. Over the past decade, the School of Aviation Safety has averaged nearly 650 ASC and ASO graduates per year.

# BACKED IN

By Lt. Keith Dienstl

The *Kitty Hawk* and CVW-5 team were nearing the end of their 2000 spring cruise. The crew could see light at the end of the tunnel as the Hawk rounded the southern tip of the Kwa peninsula and steamed north. The work was not yet done, though. All the countries bordering the South China Sea soon would be sending fighter aircraft to look at one of America's premier air wings in action while we steamed northeast.

The first crew would brief around 0300, and

Photo-composite by Matthew J. Thomas


the last crew would recover at 2200 to 2300. This pace would wear down anybody, and the Liberty Bells were no exception.

Finally, we had just one more morning sortie before a Hong Kong port call and some much needed R&R. Who would volunteer for that last morning hop? There weren't any night flights the previous evening, so a couple crews were eligible. As a young enterprising CAPC and always yearning for more experience and flight time, I jumped at the opportunity. One of our up-and-coming, enthusiastic 2Ps eagerly joined me to provide a complete front-end crew. Insightful conversation about our next outdoor adventure wouldn't allow any drowsiness to creep into our cockpit. The rest of the seats soon were filled, and the next thing we heard was that dreaded alarm clock at 0230. Heck, I felt like I just had started to doze off when that incessant buzz awakened me.

We headed to the wardroom for a quick breakfast. At the crew brief, I stressed the need to resist a lax feeling, but it appeared to fall onto the deaf ears of a lethargic crew. We geared up, read the ADB and sauntered toward the flight deck. As I took that first step onto the wet flight deck and into the blackness, a heavy mist blanketed me, while a stunning realization struck. This was not the hop to volunteer for.

I pressed on across the foggy, dimly-lit flight deck toward my awaiting Hawkeye. The preflight and start went without incident and we soon were ready for launch. As we taxied aft, the sky lightened and revealed a foreboding grayness. I reached forward and switched on the stormscope, while searching for holes in the dense cloud cover. Our stormscope isn't much, and is far from weather radar; it provides only information on areas of electrical discharge and is seldom used. However, this morning it was especially colorful. The only area somewhat devoid of electrical activity was aft of the ship, where we weren't going! Oh well, we taxied up, went into tension, and were shot off into the unknown. We were knocked about like a bucket of bolts as we passed through heavy turbulence. We rode our bucking bronco right into a solid overcast at 1,000 feet. We broke out at 20,000 feet and found a small, clear area north of the ship to work our racetrack.

We hadn't been airborne for two hours when our little clear area began to close in. A small break in the clouds presented itself, so off we went. Our little Hummer found a much larger patch of sky to the southeast of the ship. It wasn't long before the backenders told us radar coverage wasn't optimal from that location. We needed to head toward the northwest—right

where we didn't want to go, from a front-end perspective.

We flew on and soon entered the turbulence, which was followed by steady rain. The engine anti-ice came on and, with it, our fuel consumption increased. This normally wouldn't concern us, but we were scheduled for a 4.0, which usually meant at least a 4.5 by the time we would recover. On this mission, fuel conservation was one of our main priorities. As time wore on, the weather showed no signs of improvement, but recovery time neared. We asked approach control for a manual push from altitude, trying to conserve what little gas we could. Just as the much-anticipated commencement of our recovery was to begin, contacts of interest suddenly blipped onto the radar screen, and we were delayed momentarily. Word came that our needed relief was having some minor holdups back aboard the *Kitty Hawk*, and the bigwigs below were stressing the importance of continuous radar coverage. As expected, we were asked to stay on station. We figured on another 15 to 20 minutes were all we could spare.

The admiral's staff demanded an E-2 remain airborne. Our fellow Liberty Bells had not launched yet. The backenders relayed the urgent request to stay airborne forward. Here we were—a new CAPC and a junior 2P—in the overcast, with freezing temperatures, steady rain, low on gas and searching to find medium ground that wouldn't have me standing tall in front of CAG explaining a hasty recovery. I felt backed into a corner. Wait a minute, though: I signed for this aircraft, and I have five lives in my hands. Their safety was the most important thing, especially when the operation didn't warrant unnecessary risk. That was it, the decision was made. We were going home!

We calculated the consumption rate for our remaining fuel and picked a drop-dead time. We would give the flag staff all the time we could spare. We soon hit the mark and called approach control with a "Ready to come aboard." We then completed approach checks and started down. Our aircraft was the last to recover, and we were late, but we had an excuse. As we continued inbound, conditions deteriorated, temperatures warmed, and the downpour intensified. The Hawkeye's ill-designed windshield-wiper system would have to be used. We turned on the virtually useless wipers, and, with that, our visibility was reduced significantly. I strained to see anything through the streakish blur the wipers left on my windscreen, dreading the moment I would need to transition to an outside scan.

We figured we had one chance to get aboard, maybe two. There was no available divert; the ship was our only option. We still were in the clouds as we leveled at 1,200 feet. My copilot worked feverishly to provide constant backup on headings, altitudes and airspeeds, as I concentrated on my flight instruments.

"Fly up and right," he relayed as the needles popped into view on our attitude indicators. After some vigorous adjustments, the needles were on and on, and I started a gentle rate of descent. Visibility was severely limited, but we knew the cloud bottoms couldn't be far below. The approach went as smoothly as could be expected. A sense of confidence and ease began to overcome us as momentary glances of choppy water began to appear. Suddenly, my azimuth needle began racing toward the right, the rain intensified, and an instant later, we broke out of the cloud cover at 400 feet.

The wiper speed was cranked up, but our visibility only worsened. I struggled to stay with the needles as it became obvious the ship was in a hard-right-hand turn. Fortunately, my copilot caught a quick glimpse of the ship and followed with a, "Come hard right." I did so for about 30 to 40 degrees. Upon leveling, the needles immediately settled down. I was able to fly them in to three-quarters of a mile, with an occasional blurred glimpse of the ship. We called, "Clara ball. Clara lineup." The LSO's calm voice began the talk down. I saw a yellow blur that made up the meatball and blindly followed the calls for lineup.

In another instant, we were jerked forward against our straining shoulder harnesses as our hook found a wire. We both looked over and sighed heavily in relief as the flight for which we had originally volunteered wound up being much more than we had bargained for.

Lt. Dienstl flies with VAW-115.

Classic

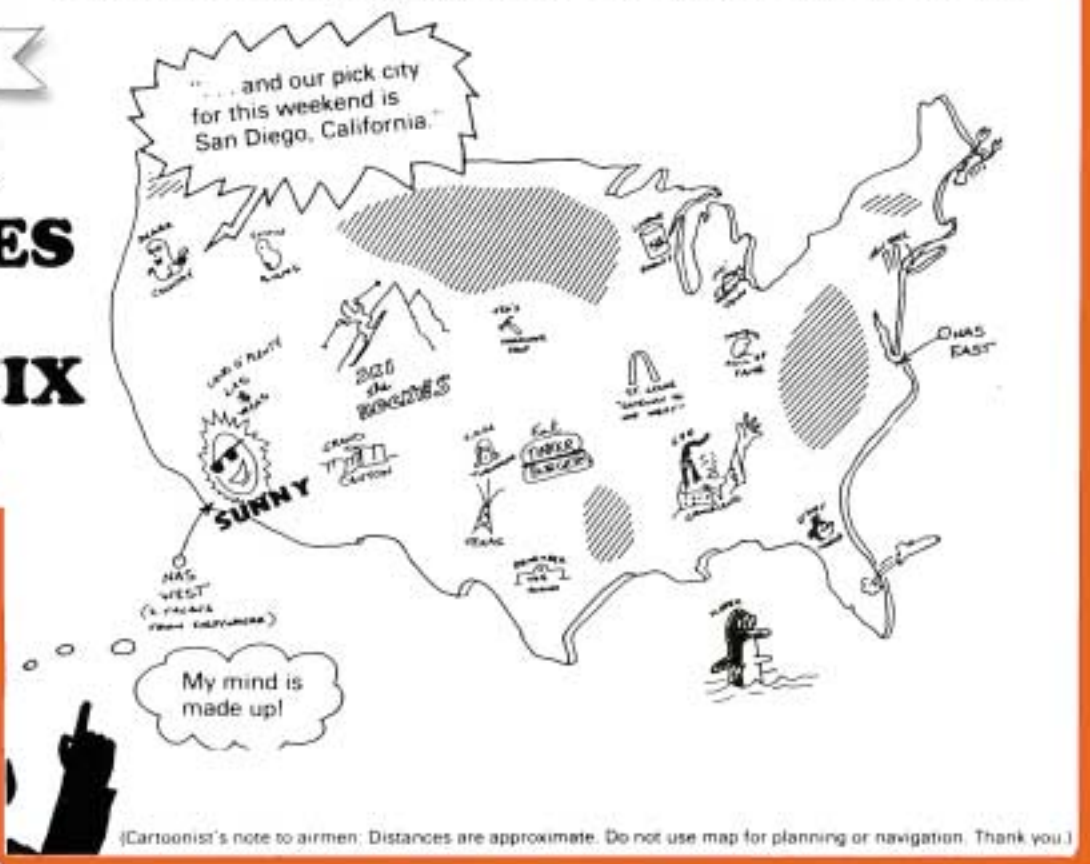
Mooch with help from Hey Joe presents:

# BROWNSHOES IN ACTION COMIX

"The kind real aviators like"

Contributed by Lt. Ward Carroll

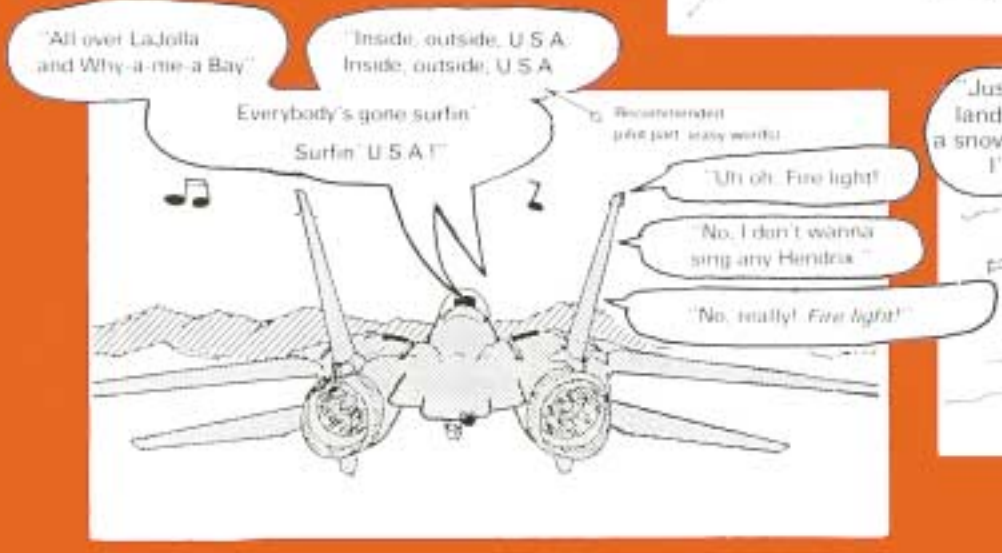
**Dangerboy brainstorms on a destination for his upcoming cross-country . . .**

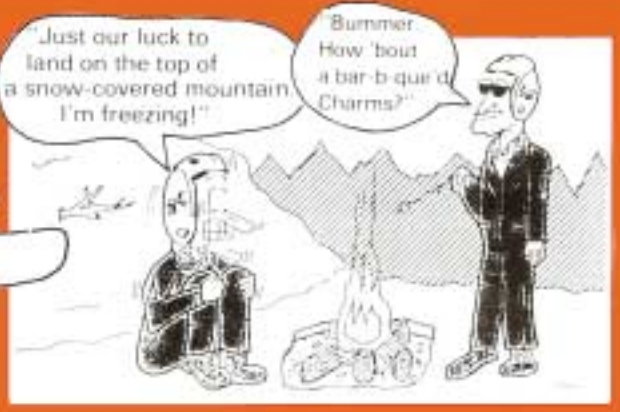



(Cartoonist's note to airmen: Distances are approximate. Do not use map for planning or navigation. Thank you.)

Finding a RIO is no problem as VF-3 14's FNG is from the area





# Ready Room Gouge

**The purpose of the propeller is to keep the pilot cool.**

**If you think not, stop the propeller and watch him sweat.**

www.safetycenter.navy.mil

EP-3 Photo by Matthew J. Thomas
Background by Allan Amen