Reducing Mishaps by 50%

THE NAVAL SAFETY CENTER'S AVIATION MAGAZINE

approach

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Smoke in the Tube

Over the Bayou

WHEN LIGHTNING STRIKES

approach

The Naval Safety Center's Aviation Magazine

January-February 2004 **Volume 49 No. 1**

On the cover A photo taken by TSgt. David W. Richards, USAF, in an E-2C Hawkeye is modified by Allan Amen for the article "Smoke in the Tube," on page 18.

On the back cover A homecoming reunion for crewmembers of VAW-126 returning from Operation Iraqi Freedom. Photo by Fred J. Klinkenberger Jr.

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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.

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Fellow aviators,
Beginning with this issue, Approach *will be published bimonthly.—Ed.*

Features

A picture's worth a thousand words...and thousands of hits on our website.

Check out the Photo of the Week at Http://safetycenter.navy.mil/photo/default.htm

Photo composite

Departments

January-February Thanks

Thanks for helping with this issue…

LCdr. Nathan Yarusso, VAQ-131
LCdr. Robert Polvino, VAW-124
LCdr. Paul Olin, VFA-113
Ltjg. Jon Styers, VS-24
LCdr. A. R. Wagner, VAQ-134
Lt. Nicholas Ferratella, VAW-123
LCdr. Stevin Johnson, VFA-97
Lt. Mark Forstner, HSL-44
Lt. Sean Rich, VT-3

HAZREPS: Improving how we do business

Early last year, a newly designated HAC, on his first flight, signed for the plane and looked forward to a super mission. However, the flight was eventful and anything but routine: an engine failed. He executed the NATOPS procedures and landed safely. He recalled that other squadrons had experienced similar incidents and a hazard report was required. He headed for the safety office and found himself struggling through the hazard-reporting process.

That was last year. Since then, hazard-reporting procedures have been updated and streamlined. Here's the 411 on hazreps you should know.

OPNAVINST 3750.6R, Chapter 4, is the guiding instruction for hazreps.

It is important to remember that, unlike safety-investigation reports (SIRs), hazreps are not privileged.

On Aug. 11, 2003, the Commander, Naval Safety Center, signed Change 2 to the 3750.6R. This change removed and replaced all of Chapter 4 and resulted in these improvements:

- A more user-friendly document
- Reduced number of pages more than 50 percent
- One standard reporting format for aircraft and UAVs

Types of hazreps:

General Use Hazards (GENUSE)
Electromagnetic Interference (EMI)
Out of Control Flight (OOCF)
Bird-Aircraft Strike Hazard (BASH)
Near-Midair Collision (NMAC)
Physiological Episode (PHYSEP)
Embarked Landing (EMBLAND)
Air Traffic Control (ATC)

Why submit hazard reports?

- To report a hazard and the remedial action taken so others may take similar action

• To report a hazard and recommend corrective action to others

• To report a hazard so other organizations may determine how to fix the problem or control the risk

• To document a continuing hazard in order to establish risk severity

Special cases for hazrep submission:

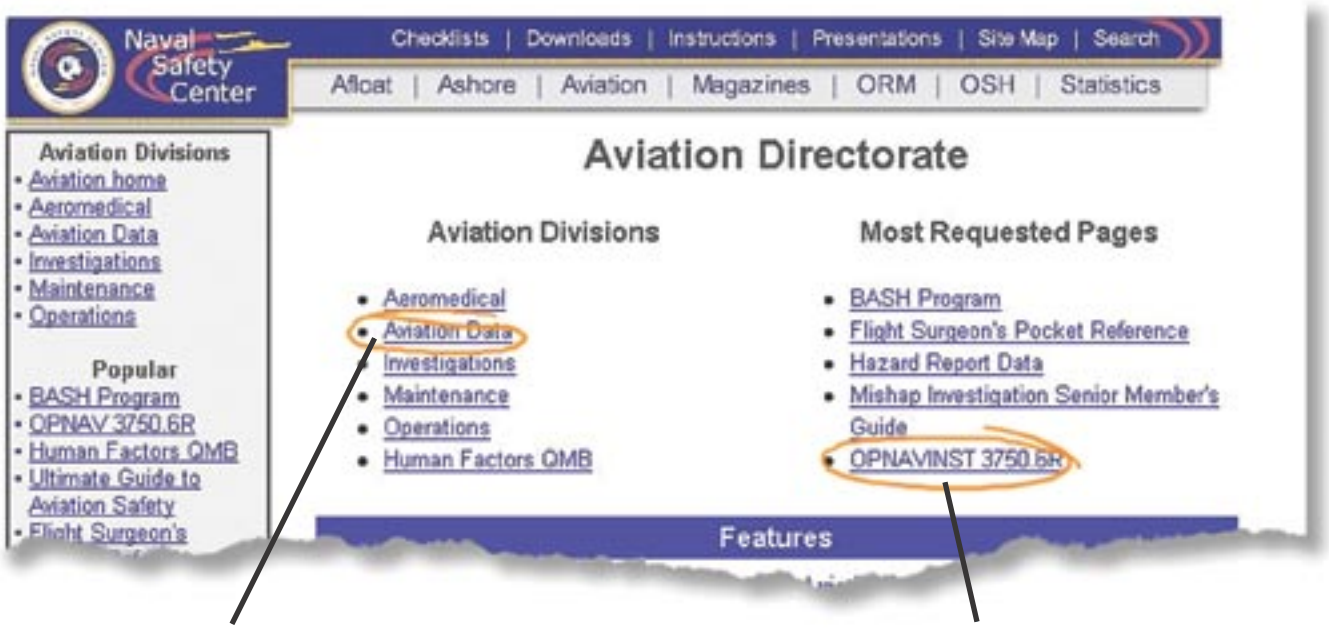
• An aviation-mishap board (AMB) finds severe hazards among their cause factors that require immediate attention.

• An AMB detects hazards that are not themselves causal factors in the mishap under investigation.

The bottom line:

Mishap prevention often depends on detailed, accurate hazard reports.

Visit our aviation-directorate website for more information at: http://safetycenter.navy.mil/aviation/default.htm.



Click here to obtain aviation hazard-report information for your aircraft.

To view OPNAVINST 3750.6R, Chapter 4, click here.

Have questions about hazreps? Contact Kimball Thompson, executive assistant Aviation Safety Programs, Naval Safety Center at: edward.thompson@navy.mil.

TOWARD THE GOAL

Reducing mishaps by 50%

The Naval Safety Center recently hosted the preliminary meeting of the Navy and Marine Corps Safety Council. Getting the top members of our safety teams together, developing and implementing a plan of action, and making real progress toward a 50 percent reduction in mishaps is the challenge before us.

Here is some feedback from our safety leadership we want to share with our readers.

"We hosted a preliminary, working-level Navy and Marine Corps Safety Council meeting aboard Naval Station Norfolk. During this meeting, USN and USMC representatives discussed our mishap-reduction plan, SECNAV's Safety Council Charter, and the Navy's strategic plan to reach the 50-percent mishap-reduction goal within two years. I emphasize the operative word for successfully meeting and exceeding our mishap-reduction goals will be "buy-in" by everyone involved. Our actions will set the tone. We can no longer operate under the guise of business-as-usual, nor can we expect to reduce mishaps through administrative steps such as redrafting instructions and regulations. Let's not re-invent the wheel, as we sometimes do. It's time to change our cultural thinking, and "think safety" before, during, and after duty hours, while on liberty and leave—in short, '24/7.' And, as we all know, operational risk management (ORM) is critical to having a safety-conscious Navy and Marine Corps team able to sustain its lethality, meet operational commitments, and always be ready to meet unexpected surge requirements, all while protecting our most valued asset, our people.

"It's up to all of us, from the CO down to the most junior supervisors, to set the example and motivate our deck-plate Sailors and field Marines to understand and accept safety as a way of life, not something temporarily thought of only while on the job. Senior leadership must engage itself and set the tone for their command. The challenge to all of us is to 'make it happen.' We need across-the-board participation at all levels to take our DoN safety program where it must go."

—RAdm. Dick Brooks, COMNAVSAFCEN

HOW ARE WE DOING?

Here's information on our safety status as we work toward the goal.

Aviation (Rates = Mishaps Per 100,000 Flight Hours)

Class-A Flight Mishaps (FY04 thru 31 Dec)

Service	*Total/Rate*	*FY03 thru 31 Dec*	*FY04 Goal**	*FY05 Goal**	*FY01-03 Avg*	*Fighter/Attack*	*Helo*
USN:	1/0.41	5/1.87	14/1.24	10/0.88	20.3/1.76	1/1.72	0/0.00
USMC:	4/4.91	1/1.21	10/2.75	7/1.94	10.3/2.76	3/8.26	1/3.08

** Goals based on FY02 baseline.*

FY04/05 rate at or below goal.

FY04/05 rate above goal.

For current information on aviation statistics visit: www.safetycenter.navy.mil/statistics/aviation/default.htm

Mishap-Free Milestones

VP-46	40 yrs.	280,000 hrs.
VFA-37		10,000 hrs.
CPRW-2	18 yrs.	15,100 hrs.
Executive Transport Det		
VAQ-136	16 yrs.	26,270 hrs.
VFA-34	1 yr.	3,600 hrs.
VR-53	10 yrs.	40,126 hrs.
VFA-113	15 yrs.	
VS-30	24yrs.	83,400 hrs.
VFA-131	16 yrs.	67,900 hrs.
VMFA-314	7 yrs.	33,000 hrs.
VAW-121	37 yrs.	
VP-4	32 yrs.	211,000 hrs.

Landing Out of Limits

By LCdr. Doug Thompson

We were 10 minutes from flight quarters when the lights went out. The "lights" usually refer to aircraft power, but not this time.

I was the OinC of an HSL detachment doing escort operations in the Bab el Mandeb, in support of Operation Enduring Freedom. I was the HAC, and we were to locate and escort a certain ship. We found it 20 miles in front of our *Spruance*-class destroyer, heading in the opposite direction. The plan was to have the ships rendezvous; then, our ship would turn 180 degrees to join on the escorted ship. I would land, get a hot pump, and relaunch for a second bag. This flight was the second of two escorts for the det that day, and each crew had to double up as each escort mission took six to eight hours. It was late afternoon and sunny but very hazy with blowing sand. The visibility was four to five miles.

So, there we were, 10 minutes away from flight quarters, when the lights went out—on the ship! It was maneuvering to a reciprocal heading, when suddenly, it stopped turning. We then lost our signal for datalink (our primary secure comms), and I knew something was wrong with the ship. We had 45 minutes of fuel left.

I called the ship on land-launch but had no joy. We had maritime bridge-to-bridge frequency in the No. 2 radio to talk with the civilian ship we were escorting. After waiting five minutes to see if our ship could come back on-line, I called mom on channel 16 to establish comms. I learned the ship had suffered a major engineering casualty and literally was cold and dark. They couldn't correct the problem and get underway again for at least an hour. Now down to 30 minutes of fuel, we told the ship to set flight quarters by whatever means possible. We realized our options were extremely limited. No other ships were within reach (we were escorting a group III cargo ship), and diverting to Yemen or Eritrea to land on unprepared terrain wasn't inviting. Mom was our only option.

Here's the rub, to quote George Costanza: "The sea was angry that day, my friends." Winds had howled all day at a steady 30 to 40 knots. The ship was beam-to-the-wind when it went DIW and stayed there; it was rocking and rolling pretty good. (Wind envelopes for tail-rotor-equipped aircraft primarily are formulated with the winds off the bow to help maintain tail-rotor effectiveness). With the ship foundering broadside to the wind, our relative winds were 050 to 060 degrees relative to the ship at 30 to 40 knots, well outside the SH-60B envelope.

The SH-60B NATOPS has a diagram in chapter 11, dreamed up at Pax River, which describes the bad things that can happen when you land with relative winds from positions other than in the envelope. We discussed these issues and had our SENSO pull out the NATOPS in the cabin and back us up. We were facing possible loss of tail-rotor effectiveness because of the tail-rotor-AOA reduction and the dreaded weather-vaning effect. We verified flight quarters were set via the bridge, and we discussed our options.

With 20 minutes of fuel left, I decided to shoot a left-to-right approach, instead of the normal up-the-stern approach, to keep the nose into the wind as long as possible. I then would pedal turn and set the aircraft on deck. If it didn't feel or look good, I would wave off to starboard and try again. Once cleared via the bridge, I commenced the approach and flew it with no trouble. After completing the pedal turn, the pedals felt a little mushy, but I quickly landed, and we shut down uneventfully. The winds barely were under the 45-knot-maximum limit for disengagement.

I know what you're thinking—an anticlimatic ending to a promising start of the article. However, many things can be learned from this story. Navy ships do break and can leave you in trouble with nowhere to go, particularly in the world of LAMPS.

What if this had happened at night? We would have had to conduct an NVG approach and land on a ship with no deck or hangar-face lights, in hazy conditions, and with severely limited visibility. Sounds like fun, right?

As pilots, we early are taught to play the "what if" game. By using all our assets and acting collectively as a crew, we turned a bad day into an uneventful landing. Keep learning how to play the game because the rules keep changing.

LCdr. Thompson flies with HSL-44 Det 1.

A Little Too Relaxed

By Lt. Joseph Bayer

Midcruise doldrums were in effect, and I was a little too relaxed on the KC-135 tanker. "Lopez 21 port observation, nose is cold, switches safe, Buno xxxxxx looking for 6K."

It still was daytime, calm, and the weather was clear. As I flew to close in for the plug, the basket moved ever so slightly to the left. I remember thinking, "I can make it in." The probe of my FA-18A lipped on the outer one-third of the basket, the entire basket folded back, and pranged against the side of my nose cone. After backing out and uttering a few expletives, I plugged again. "Lopez 22, I'll need an airspeed check on our way home."

After tanking, we headed home to mother with a rapidly setting sun behind us. The airspeed check had my AOA showing three degrees less than my wingman's AOA, with accurate airspeed indications, and I had no cautions. My starboard AOA probe was attached, with no visible signs of damage. Unlike the FA-18C, I was unable to deselect one of my AOA probes. If one of them wasn't working, the whole system was inaccurate. We headed home at a slower-than-normal airspeed because I was worried about something coming off the side and going down the starboard intake.

By the time we checked in with strike and asked for a rep, it was hazy and dark as hell.

It was time for the dirty airspeed check. As my gear came down, I immediately had other issues. My AOA bracket and approach lights showed a "fast" indication—that was expected. What I didn't expect was the INS VEL caution light and a cycling VSI ranging from minus 800 to plus 800 fpm. I held level the velocity vector on the horizon bar and watched the radar altimeter tick down steadily in altitude.

A Hornet pilot's fear was upon me. I would have

Photo by PH3 H. Dwain Willis

to do a night-standby pass at the boat with dangerously inaccurate AOA indications, a standby VSI, and no auto throttles—not a fun situation. I'd rather do a single-engine approach. I was loaded with ordnance and had two chances to get aboard before needing a tanker.

I briefed paddles and asked marshal to give me a longer straightaway, so I could adjust my scan and cage my brain for the approach.

Coming down the chute, I floundered with the new scan. I fought the urge to center the AOA bracket, which would have made me dangerously slow, and flying standby did not feel comfortable. By the grace of God, I got to a decent start.

"303 Hornet, ball, no AOA, stand by."

As my scan shifted to the ball, I again unconsciously started to center the E-bracket, and the jet began to flare like a cobra: not good. I was slow and low.

"Power." I cobbed on power, flattened out, skipped the 1-wire, and caught the 2-wire. I was aboard in an ugly manner, but it never felt so good to feel my aircraft come to an abrupt halt.

Complacency on the tanker was my first mistake. I had been doing in-flight refueling every day for the last three months, and I had no fear of the iron maiden. That contraption really can do some damage if you're not careful.

Going back even further, I wish I had practiced more standby approaches during work-ups on the beach, at the field, and in the simulator. The HUD, velocity vector, and auto throttles can be a crutch. You still need to get aboard without them.

I was fortunate on this pass. A timely call from paddles kept me from hitting the back of the ship. Learn from my mistake.

Lt. Bayer flies with VFA-97.

Farmer Fields Forever

By LtCol. Peyton DeHart, USMCR

"Keep an eye out for enough flat ground to swing blades without hitting anything," I told the frontseater.

"Lower…slower…land" (the helicopter pilot's mantra when encountering lowering visibility and ceiling). Pulling collective and climbing into controlled airspace is one way to cope with impending IFR conditions. But, another way is to get closer to the ground, slow to compensate for degraded visibility, and land in a safe spot if the situation becomes untenable. Your current fuel state, possible destinations, crew configuration, or aircraft capabilities tend to dictate the smartest course of action.

At the end of a Boy Scout Jamboree static display, I grabbed my copilot and headed home under increasingly threatening skies. We hopped into the Cobra's cockpit, made an impressive departure in front of the aspiring naval aviators, and climbed to FAA-legal altitude for our flight home. A number of miles passed under the nose as the aircraft brushed the bottom of the weather ceiling. Then, drizzle cut our visibility, and we slowed to avoid running into uncharted towers. We further were disconcerted to find the ceiling was on a slow slant toward intersecting the horizon. We descended when we had to, until we found ourselves at altitudes over the treetops and following roads.

We poked through promising paths of country roads and soon realized fuel loomed large on our list of concerns. What should we do about our fuel situation—land and wait out the weather, or find a place to sleep? The average warm front moves over the ground at 10 to 20 knots, and fast cold fronts push 25 to 30 knots, so most weather problems resolve themselves by the mere passage of time. You must be convinced you have time to wait for the weather to clear—trust me, you do.

When we had gone down a few roads and found further passage blocked by clouds that touched the treetops, our meandering through the murk had ceased to be fun.

"Keep an eye out for enough flat ground to swing blades without hitting anything," I told the frontseater.

"Does that count, ahead?" he responded.

"A baseball field—perfect. Little League won't be playing in the rain today, anyway," I said.

We flared, landed at the shortstop position, and shut down. Looking toward home plate, through the backstop fence and across the road, we spotted an unprepossessing storefront.

"Let's walk across the street to whatever store that is because we're going to fog up the inside of the cockpit sitting here," I said.

We got out and walked over to what turned out to be Zeb's Bar-B-Que.

"Might as well get some food and eat slowly; we'll be here a while," I offered.

I'm happy to report that Zeb and his kin make really fine barbeque, with a pepper-vinegar-based sauce. The meal and a lot of sweet iced tea occupied the balance of our afternoon. An hour before sunset, the no-go time, we called the weather folks, walked outside to verify the favorable forecast, and said goodbye to Zeb's. We climbed into the Cobra and headed home to brightening skies.

I've landed in a few fields over the years, found great barbeque and beef on the hoof (in separate instances), and will make the next unplanned landing whenever weather dictates. That's better than hitting trees, towers or terrain.

LtCol. DeHart flies with the 4th MAW.

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No EP for This Emergency

By Lt. Francisco Alsina

Our EA-6B squadron was headed to Pt. Mugu for a live-fire HARM-missile shot. For many of us, this shot would be a first. I noticed, on the way to work, it was your typical Northwest winter weather: The sky was grey, with low overcast clouds. The weather brief at NAS Whidbey Island confirmed what I saw; we would be in and out of clouds and would have icing during most of our climb-out.

I was ECMO 1 in Dash 2. Flying in parade formation up to 30,000 feet, while going through the clouds with icing, is not something aviators want or look forward to. During the brief, we discussed lost-comm and lost-contact procedures. Both pilots were senior JOs who had flown together in section for years, so no one was worried about the en-route weather. We were more concerned about the weather at Fallon (for our gas and go) and at our final destination, Pt. Mugu.

The two crews went about their business: suiting up and preflighting. Nothing happened until soon after takeoff. We went into the weather at 4,000 feet. The clouds weren't bad enough to split up the flight into singles, but I could tell my pilot was not enjoying the added workload of flight wing in and out of clouds. We had filed for a final cruising altitude of 27,000 feet, but, as soon as we got there, it was painfully obvious this altitude would not work. Both jets reported icing, and we were losing sight of lead with the passing clouds.

The lead jet asked for higher, and the flight then climbed to 30,000 feet. The higher altitude was not much better, so we requested 33,000 feet, and finally broke out into clear airspace. By now, we were aware the weather was not typical of the northwest. No one could remember the last time we had gone into the clouds at 4,000 feet and broken out at 33,000 feet. The temperature was far colder than expected; I think it was about minus 40 degrees Celsius at 30,000. My pilot and I were relieved the climb was over, as lead kicked us into cruise for the remainder of the flight. We could relax a little.

The respite lasted just a short time; in a matter of seconds, frost covered all the cockpit glass. My first thoughts were to begin rattling off the smoke- or fumes-in-cockpit emergency procedure, but there wasn't any smoke or fumes. My pilot thought one of the ECMOs in the back was playing a joke and demanded they stop. He forgot the backseat of the Prowler has no electronic-control-system (ECS) controls. The pilot quickly moved the jet away from lead, moved farther right and a little lower, and executed our briefed procedures for lost contact.

I could tell my pilot was growing more irritated, and I can't say I blamed him. He was trying to fly in section, using his left hand to run the throttles and to wipe off the canopy to keep sight of the lead. I went to full hot on the ECS, hoping this would help; it didn't. I also turned the defog to full flow, just as you would on a descent. What happened was the opposite of a descent after long periods of flying at cold temperatures. We had flown right through a pocket of warmer and more moist air.

After the valves opened for the defog, I expected the canopy to clear. Instead, it got worse, much worse. I touched the ducting for the defog, and it felt cold. The air within the pipes must have been just as cold. Turning on the defog expelled the cold air onto the canopy, exacerbating the situation.

Once I went to full hot and maximum defog, there wasn't much else I could do to help my pilot. He was flying form and fighting the frost on the canopy. It took about 10 minutes for the canopy to clear. Once we could see, I turned off the defog and added a little cold into the cabin for comfort—not a good idea. The frost quickly came back. Eventually, I was able to keep the defog on and the temperature at a reasonable level, but, anytime I turned off the defog, the frost came back. For about an hour and a half, we flew with the defog operating.

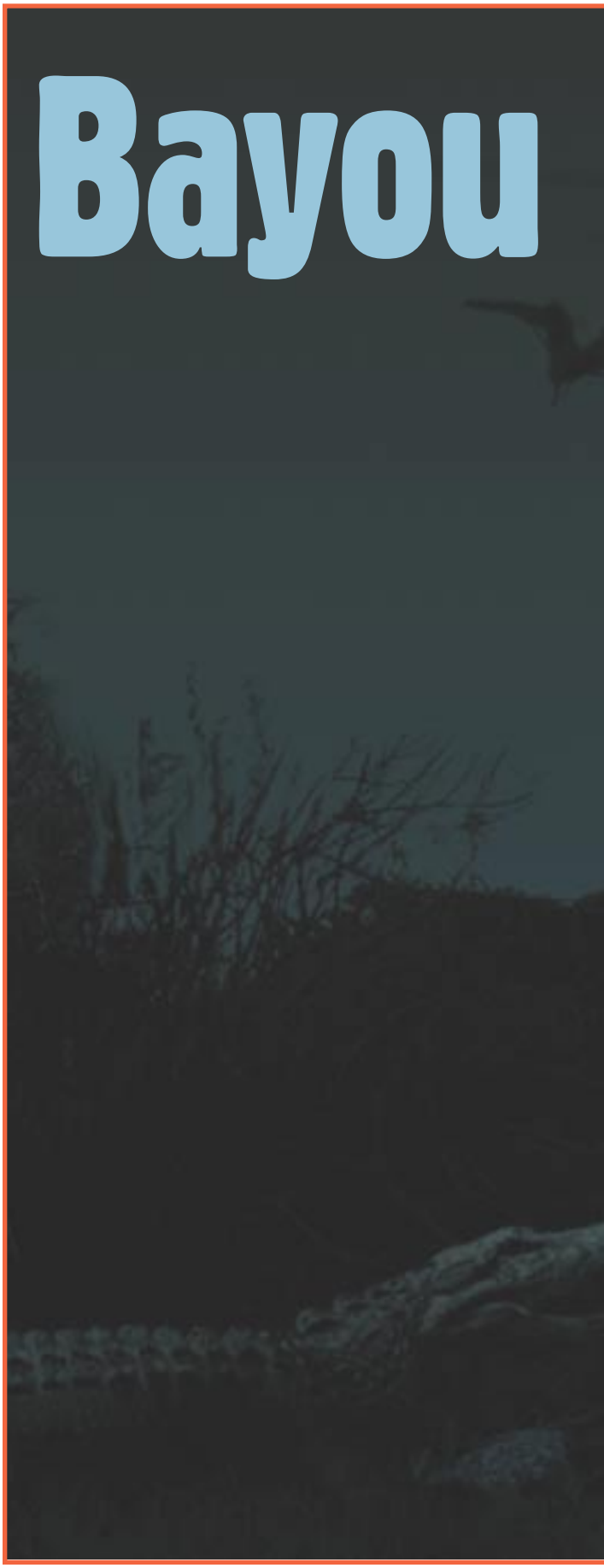
On our descent into Fallon, the frost problem went away when the climate changed. We hot-pitted and flew our second leg to Pt. Mugu. Encountering severe icing and a broken transponder only added to the already "fun" flight.

In the debrief, I asked the crew of the lead jet if they had the same problem at the same time, and they said "yes." I didn't give their response much thought, but lead should have asked if we had the same canopy problem.

Looking back, I realize the frosting canopy was indeed an emergency. Losing sight of lead is not fun or safe. Procedures were briefed and executed, and, being wing, we were in charge of maintaining separation. If this were to happen again, I would split up the flight into singles and would not complicate the situation with the added burden of flying formation. A closer look at weather briefs, the instruments in flight, and applying my experience should help me avoid a similar occurrence.

Lt. Alsina flies with VAQ-134.

Over the Bayou



By LtCol. Tom Longo, USMC

I should have known we'd have a problem when two reserve O-5s (lieutenant colonels) were scheduled to fly together. It was an innocuous, day-VFR flight from North Carolina to New Orleans. With one very experienced crew chief (gunnery sergeant) and one crew chief under training (lance corporal), we had a total of about 10,000 hours of flight experience. We were to fly the big CH-53E to the commanding general's change of command.

One gripe led to another, and we left late. Halfway to the first fuel stop, we noticed that the second-stage hydraulic pressure had dropped below its minimum pressure—it was rock steady at 1,000 psi. We troubleshot the problem and decided the gauge was bad. Then the quantity started dropping. Fortunately, our crew chief under training could open cans fast and pump like a fire engine, and he kept the quantity in the green until we could divert. The Air Force folks were kind enough to make a new line and sell us a few gallons of hydraulic fluid, and we were on the road again just before dark.

I fly EMS helicopters on my real job, so I fly unaided every night. For some reason, though, the thought of flying a Marine helicopter without NVGs was unnerving, even though we used to fly

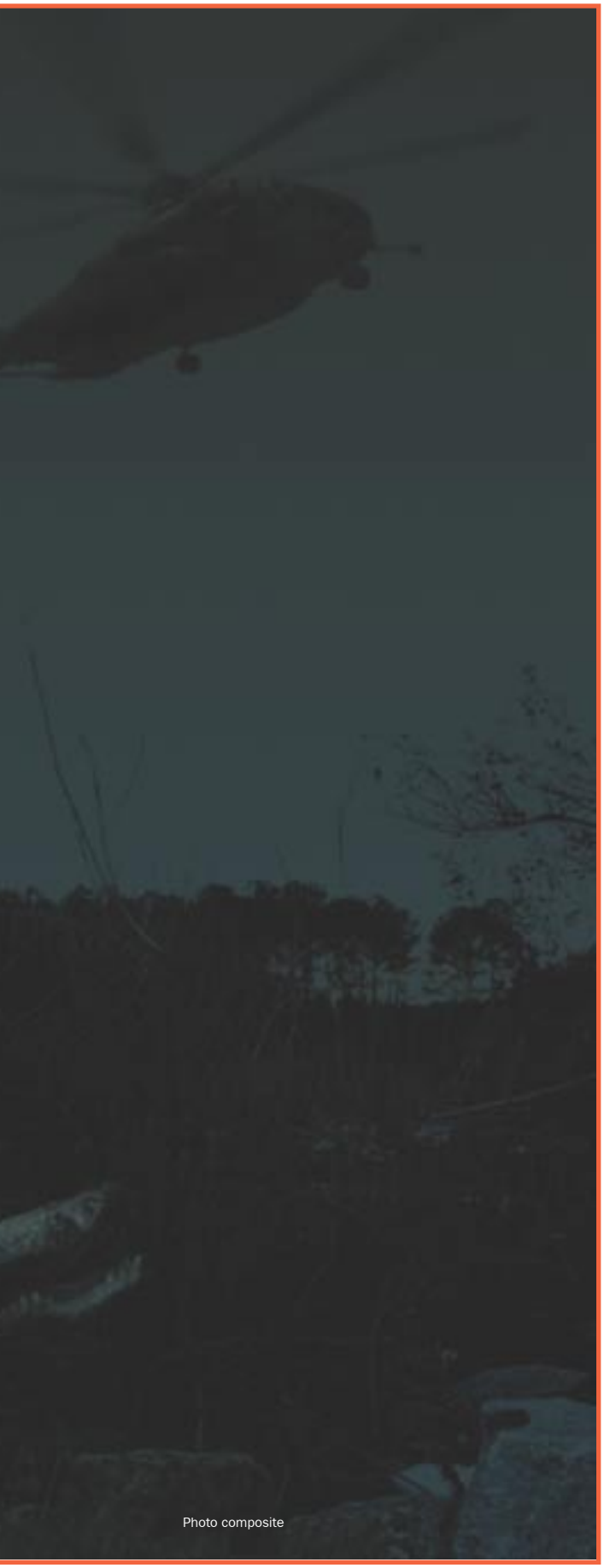


Photo composite

I looked outside and thought, "That's where all the alligators live." Now I know how Captain Hook felt.

that way all the time. We also used to fly without GPS (remember OMEGA?), but I wasn't too happy about flying with a broken GPS, either.

Right after passing Biloxi, we cut out over the water to save time. We were knocking on the end of our crew day, and we had big plans for Bourbon Street.

Ten miles from NAS New Orleans, at 1,000 feet, we were handed over to Alvin Callender tower. We received landing instructions for runway 32. I told the helicopter-aircraft commander (HAC) to con tower into letting us land on runway 22; it would be straight in for us.

The HAC was flying, and I had the airport diagram. He wasn't sure of the relationship of the field to us because it just looked like a bunch of lights in the middle of a swamp. I was trying to explain the situation to him when everything went black and kind of quiet.

The nose of the helicopter pitched up and then did the funky chicken. We lost all our electrical power, which means we also lost our automatic-flight-control system (AFCS) and hydraulic-servo assist. That situation makes flying the aircraft like stirring wet cement with a broomstick. I looked outside and thought, "That's where all the alligators live." Now I know how Captain Hook felt.

I quickly reached over and reset the generators, and the electricity came back. Then, piff, the lights again went out. After much jiggling, I managed to get the No. 2 generator on line; Nos. 1 and 3 just wouldn't play.

We had a lot of caution lights illuminated—I never have seen so many. My experienced crew chief said, "We have an accessory-gearbox failure."

I'll be damned if the gunny wasn't right. We lost the Nos. 1 and 3 generators, and the second stage and utility-hydraulics systems. The CH-53E has a big gearbox, driven by the main transmission, which drives most of the accessories. Fortunately, Uncle Igor put one hydraulic system and one generator directly on the main transmission for such situations.

AC ELECTRICAL FAILURE

- If two generators fail at night, land as soon as possible.

As a good copilot, I immediately slapped the gear handle and squawked emergency.

UTILITY HYD SYS FAILURE

- Landing gear—extend.
- Land as soon as possible.

The HAC declared an emergency, and we prepared to land. Then the gunny said, "The gear is not down." Right again. Without any utility-hydraulic power, the landing gear won't lower. I had an opportunity to "blow the gear." A thousand times, I had checked an emergency gear handle to make sure it was down and shear wired, but I never had used it. So, I gave it a mighty pull, and one, two, down and locked. Our right main-landing gear was stuck in the well.

Tower cleared us to land, but the HAC pulled us into a 100-foot hover while we troubleshot the gear. Landing with one gear stuck usually isn't a big deal. Plan A would be to land on the good wheel, kick out one of the crew, and have him pull down the gear—that's why we brought a lance corporal. Without the servos, raising the collective, and moving the cyclic is extremely strenuous. Doing that gets old, fast and after a while, would make precision hovering nearly impossible.

Plan B would be to lower the rescue hoist to ground the aircraft. A CH-53E builds about 6,000 volts of static electricity. The amps are low, but still it's going to hurt like hell. We then would hold a higher hover and have a rescue worker pull down the gear. We had a former crew chief from our squadron waiting at base ops who could do it. Base ops said he was running late, and, unfortunately, the rescue hoist wouldn't work—plan B had some problems.

The HAC was getting tired, so I took the controls. I was weary of our situation and decided to practice one-wheel landings. My attempts didn't look good, and we went back to our 50-foot hold.

The next trick is to land on a pile of mattresses. This technique is dicey because every try at landing looks like an oak leaf falling to the ground. We asked tower to find some mattresses. Most 53 squadrons keep a pile of mattresses in the hangar for such an occasion. NAS New Orleans doesn't have any 53 squadrons, and the Huey and Cobra squadrons stationed there only use mattresses for sleeping.

Then tower said, "We can't find any mattresses, but we just had a hurricane, and we have a bunch of sandbags."

"Get 'em," we quickly replied.

About this time, our first low-fuel light came on. The clock was ticking; if we did not find a solution, one would be made for us.

We reviewed the option of raising the gear and landing on the flat belly, but, once again, with no utility pressure, the good gear would not go up.

While the rescue crew ran off to get sand bags, we evaluated the situation.

ACCESSORY GEAR-BOX FAILURE

- Land as soon as possible.

We were trying to do that.

I suggested we look at the endless pages in

NATOPS for landing-gear emergencies. I really wanted to take the aircraft for a turn around the pattern and pull some G's. No one else was thrilled about leaving the relative comfort of a lighted runway to take a lap around the bayou.

UTILITY PRESSURE NOT AVAILABLE TO LOWER GEAR.

• Activate landing-gear emergency-release handle.

If all gear unlock, but one does not fully extend, do this.

• At 80 to 100 knots, execute a steady-state turn to exert G forces on helicopter, or hover and have ground personnel move gear to down-and-locked position.

We already had tried the ground-personnel option, so we had to do my G thing.

Warning: Do not attempt to execute G-force maneuver with loss of utility-system pressure.

OK. No G thing. What's next?

LANDING WITH ALL GEAR RETRACTED OR IMPROPERLY LOWERED.

• APP-start

Auxiliary-power-plant start, that's the ticket! The intent of the procedure is to have power after you crash land and secure the engines, but the APP also drives the accessory gearbox. What if the accessory-gearbox drive shaft (from the main gearbox to the accessory) shears? Then all we have to do is fire off the APP, and (Bob's your uncle) we get full control and lower the gear or gently land. Although NATOPS doesn't cover this emergency, we had heard of it happening before. I say, "Ready ape."

The HAC had concerns about half a drive shaft suddenly flailing about and destroying one of the few systems still working.

I ORMed the situation. Lighting the APP couldn't be worse than landing on a pile of sandbags with the AFCS and servos off. After much conversation and systems discussion, we, as a crew, elected to try APP.

With a gentle whir, the APP came on line—and nothing exploded. Second stage and utility pressures came up to their proper levels, and the right main-landing gear clicked into place. We reset all the generators. There was much backslapping and self adulation.

I said, "Turn on the servos." The cheering continued.

I added, "Do you see me working over here? How about a little help with the servos?" The HAC turned on the servos, and the CH-53E once again was the gentle giant.

We still needed to land. We looked at the adjacent taxiway and saw the crash crew throwing the last sandbag on a giant mound. While we were worrying about us, they feverishly raced about the airport collecting sand bags, sped back, and unloaded a pickup truck worth of them. Did I mention how hot and humid that evening was?

"Tower. We've fixed our problem. We'd like to back taxi because this taxi way is clobbered."

We had two main debrief items from this flight. One was ORM, and the other was CRM. This flight was completed successfully because everyone helped diagnose the problem. Every course of action we evaluated had multiple ramifications. We chose the actions with the least risk.

LtCol. Longo flies with HMH-772

Hot Brakes in the High Desert

By Lt. Gregg Sanders

As a nugget at the Fallon air-wing detachment, I was launching on what was supposed to be my first air-wing strike. Our mission was to look for hostile radars as they became active. After the gaggle brief at NSAWC, we returned to our ready room for the crew brief.

Photo by Matthew J. Thomas

Following the normal brief items and safety-of-flight info, we went over our takeoff computations one more time. Takeoff comps had been emphasized since before we left Jacksonville. Fallon is definitely a different operating environment than most naval aviators are used to, with its 4,000-foot altitude and temperatures ranging from 100 degrees to below freezing. Fortunately for us, it was late October, and the cold temperatures usually cancelled out the high altitude, as far as ground roll on takeoff and abort conditions. Fallon's 14,000-foot runway also is a nice feature. We were a three-seater with a full bag of gas, but the numbers told us we had plenty of runway available, and we could abort all the way to takeoff speed.

Confident in our preflight planning, we walked and manned up early. We were aware of the fallout plans, and we wanted extra time to troubleshoot if we had problems. We taxied to the duty runway about 15 minutes early. We had been taking off on 31L, the 14,000-foot runway.

About five minutes before our planned takeoff time, we called tower and asked for takeoff clearance. A flight of two Hornets were approaching the initial, so tower cleared us for takeoff on 31R, which was only 11,000 feet long. As we taxied across the left runway, it occurred to me that we now were short 3,000 feet of runway. I had done takeoff comps for the shorter runway a couple of times and knew it usually did not make a difference. Typically, we had plenty of runway available, and we had the ability to abort at or past takeoff speed. How often do you have a high-speed abort anyway?

We taxied into position and were cleared for takeoff. I ran up the engines and performed the normal checks. I released the brakes, and we accelerated down the runway. As we passed 100 knots, I checked the tapes and gauges one more time. At 123 knots, two knots before rotation, my COTAC called, "Abort, door open."

I immediately pulled the throttles to idle and deployed the speed brakes. I looked at the master-caution panel and saw the "door open" light but with no associated master-caution light. As we passed the eight-board, our airspeed had decreased through 110 knots. Because we were at normal landing speed, with the same available runway as back at NAS Jax, I felt we should have no problems. I told this to my COTAC as I tested the brakes at 110 knots. The brakes felt normal, so I let the aircraft decelerate through 100 knots and began applying steady brakes. We hit all our normal airspeed-runway remaining gates with no problems and without having to jump on the binders.

We took the jet to the end of the runway and began taxiing back to our line. The brakes felt a little spongy at this point, but I didn't think they were hot. Our lineman brought us to the line opposite from the normal direction, so I had to do a 135-degree turn into my spot, instead of the normal 45. As I began the turn, the jet didn't feel right. The lineman gave me the hold-brake symbol, which didn't help. The starboard wheel would not stay put. As I continued my turn, I saw the FDC run up frantically signaling for me to stop the aircraft. He pointed to my port mainmount and gave me the "fire" signal. Once the jet was stopped, he told us to get out. The chief ran to the door, and it opened without the FDC turning the handle, confirming our original door problem. The three of us exited the aircraft without incident.

Before walking, I had read a signed-off gripe in the book for hydraulic fluid leaking on the left wheel. Apparently, the corrective action had not stopped the leak. As we taxied into the line, a Prowler's exhaust was blowing on our aircraft, keeping the wheel cool enough or keeping the fluid from dripping on the wheel. However, as soon as we turned out of the Prowler's exhaust, the port wheel burst into flames. As it turns out, my initial assessment was incorrect. Not only did the port wheel catch on fire, but the starboard brake melted the automatic-deflation valve on the starboard tire.

Always have a good handle on your takeoff computations, and never discount the possibility of a high-speed abort. If you do have a high-speed abort, always have hot brakes and brake fires in the front of your mind as you exit the runway. I was surprised we had hot brakes. I thought my brake application had been smooth, but what does a nugget know?

Lt. Sanders flies with VS-24.

Smoke in t

By Lt. John Gagliano

We were preparing for a detachment to NAS Fallon, to continue our work-up cycle. One of our planes, Screwtop 600, had been loaned to a sister squadron for two months because they were short a bird. However, the plane was on a 72-hour recall for possible redeployment with USS *George Washington* (CVN 73) battle group. When Screwtop 600 was returned to us, it required a functional-check flight (FCF) "alpha" profile.

I recently had received my Hawkeye aircraft-commander qualification and was working on my FCF-pilot syllabus. The four crew members for 600's check flight were experienced O-3s, and I would sit in the left seat. All four of us had made the last cruise, where 600 had been a workhorse, but it also had required a bit more TLC than our other three aircraft.

We read the aircraft-discrepancy book, which was at least as thick as Heidi Fleiss' black book—though not nearly as tantalizing—and walked for what would be our first man-up of the day. We started engines, and, as the pilots were completing FCF-checklist items, the NFOs suspected a bleed-air leak in the combat-information-center (CIC) compartment. The smell of 14th-stage bleed air hung in the tube, along with a smoky haze, which we also smelled in the cockpit. We secured the bleed-air switches, and the leak stopped. Troubleshooters came in to fix the problem, and we shut down without ever leaving the chocks.

On the second man-up, about two hours later, we were told the computer-environmental sensor had been replaced. The gripe was signed off, and we went flying.

After takeoff, we completed the climb checks and were passing 4,000 feet off Chambers Field (home plate) when we got master-caution and oxygen lights. The O2-quantity indicator read zero liters of LOX. We went through the non-memory items in the PCL, of which the final step is, "Land as soon as practical."

We discussed this scenario as a crew. The individual O2 regulators displayed good pressure and produced good flow.

he Tube

Photo by 1ST Combat Camera Squadron (D). Modified.

We also considered it practical to complete the FCF before departing for the Fallon work-ups. At the identify-hazards step in the ORM process, we recognized that if the oxygen was malfunctioning (though we didn't think it was), we could have a problem in the event of a fire, a decompression at altitude, or a recurrence of the cabin-temperature-controller problem we had faced on deck only hours earlier. Our FCF profile, the VFR conditions, and our close proximity to home were key factors in our final decision. We had made risk decisions, implemented controls and decided to press with the FCF.

An FCF "alpha" consists of pressing every button in the aircraft, making sure every system and sub-system is checked. It is a time-consuming process, especially for the NFOs in a bird as finicky as Screwtop 600.

The cockpit checks nearly were completed; we were waiting for the NFOs to finish the FCF checklist so we could RTB. We descended to 9,000 feet to check the cabin-pressure dump. As we were reviewing the cabin-dump-FCF procedures in the cockpit, the CIC crew checked the heating-air-conditioning system. About a minute later, we heard, "Flight, CICO. We have runaway heat back here."

We turned toward home, and, because we were below 10,000 feet, we decided to dump cabin pressure, which would help with the back-end environmental issue and also complete the cockpit checks.

A minute later, I heard, "Flight, CICO. We have smoke in the tube."

Our preconditioned response to that statement is to complete the "smoke-fumes of unknown origin" emergency procedure. This emergency is arguably the worst to have in a Hawkeye because of the large amounts of combustible electronics and the lack of ejection seats. We rushed for our O2 masks and checked in on the O2-mask ICS, which completed the first checklist memory item.

I heard the copilot (he signed for the plane as the qualified FCF pilot) declare an emergency with ATC. I lowered the nose and accelerated toward home plate, which I saw about 25 miles away. The second memory item in the EP states, "Isolate affected equipment by pulling circuit breakers and turning switches OFF." We turned off the air conditioning because we thought it might have been the source of the problem. The next step states, "If source cannot be immediately identified, generator switches OFF." We briefly discussed this step but didn't secure the generators because the smoke was not electrical in origin. The memory items continue, "Personnel air conditioning OFF" (completed), and "Cabin pressure—DUMP" (done before we started the EP).

As we executed the EP, a number of things happened simultaneously. The copilot talked to approach, while I flew and listened to him talk on the radios. The back-end crew continued to troubleshoot the smoke source (to see if the smoke actually had stopped when the AC was secured), while reviewing nonmemory items in the PCL and talking to Screwtop base. We were communicating well with each other, and our situational awareness was high.

We were set up for a direct entry to downwind, runway 28, and I pulled power to idle at midfield to slow for the landing. As I put down the gear, the back-end reported, "The smoke's clearing back here; we're

Photo by Michael Grove

OK." We reviewed the landing checklist three times and rolled out without incident.

The crew debrief brought out some interesting points. We performed the EP exactly as we had briefed it, with the pilot executing memory items, backed up by the CP, and the CIC crew reviewing nonmemory items, notes, warnings, and cautions. As an experienced crew, we had good individual and crew SA. Also, the smoke was not severe, nor were there any indications of a fire; however, declaring the emergency and getting on deck ASAP was the correct action.

Finally, we discussed the oxygen-system situation. What if the indication of zero liters of LOX had been correct? What if we had put on our masks and gotten a mouthful of rubber instead of O2? Fortunately, we had applied ORM to the situation and managed the risk, though we certainly did not minimize it.

The E-2 has a history of mishaps resulting from smoke in the aircraft.

As a crew, we did not take the most conservative approach regarding the O2 light. In hindsight, considering this flight was an FCF "alpha," the conservative approach would have been to land at Norfolk when the oxygen light illuminated. The E-2 has a history of mishaps resulting from smoke in the aircraft. Not having oxygen available creates a high level of risk.

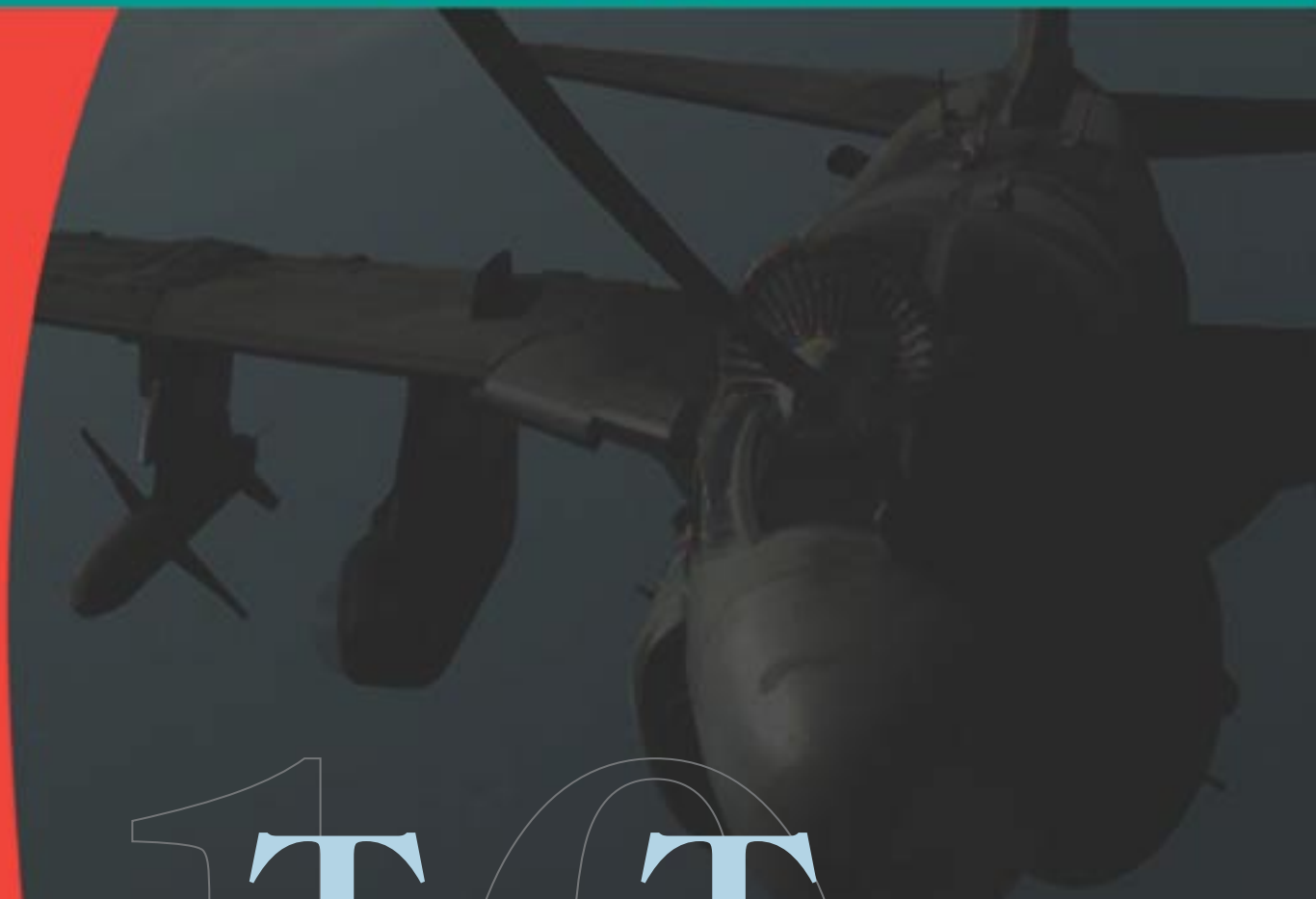
When smoke did enter our aircraft, crew coordination and individual capabilities mitigated the severity of the emergency.

This flight reinforces why we conduct FCFs in the local area, in VMC, and close to a suitable field with arresting gear. The checklist is done under these conditions to manage the risk associated with an FCF profile. We complete system checks under these conditions so another crew doesn't get the same emergency while on a mission, potentially hundreds of miles from a landing area.

ORM and FCF procedures are meant to manage risks, not eliminate them. By following procedures and applying ORM, we can operate with acceptable levels of risk, given our mission.

Lt. Gagliano flies with VAW-123.

ORM Corner



10 Top Ten Tanking Troubles

By LCdr. John Flynn

ORM Corner

Please send your questions, comments or recommendations to:

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While flying missions in support of Operation Southern Watch and Operation Iraqi Freedom, our junior officers devised a top 10 list of tanking scenarios ranked from easiest to most difficult. The objective of this ranking was to more effectively apply ORM principles, revisit fundamental procedures, and review policies on how to conduct refuelings.

At first glance, the list may seem humorous, until you realize each scenario actually occurred and, more often than not, over not-so-friendly territory.

The list was posted in our ready room. As we ended our deployment, we fondly looked back at what our squadron had accomplished, including lots of flight time, predominantly under combat conditions, and more chicken pucks than I care to mention.

I remember my crew was the only one from our squadron to divert because we could not find the tanker. In retrospect, my crew did almost everything right, and we got the skipper's jet home because we applied the ORM principles, starting with the brief and continuing throughout the flight.

VAQ-131 ORM Top 10

10. Tanking.
9. Tanking at night.
8. Tanking at night in the clouds.
7. Tanking at night in the clouds as a section.
6 Tanking at night in the clouds as a section, with only 500 feet between tankers.
5. Tanking at night in the clouds as a section, with only 500 feet between tankers and with no comms.
4. Tanking at night in the clouds as a section, with only 500 feet between tankers and with no comms, approaching bingo fuel.
3. Tanking at night in the clouds as a section, with only 500 feet between tankers and with no comms, approaching bingo fuel, and with the tanker starting to do S turns.
2. Tanking at night in the clouds as a section, with only 500 feet between tankers and with no comms, approaching bingo fuel, and with the tanker starting to do S turns when Absolute gives you a snap to your tanker, putting you back into Iraq.
1. Tanking at night in the clouds as a section,with only 500 feet between tankers and with no comms, approaching bingo fuel, and with the tanker starting to do S turns when Absolute gives you a snap to your tanker, putting you back into Iraq not once, but three times.

This story began during a CATCC watch earlier in the deployment, while listening to two sections and one single from other air-wing squadrons state their intentions to divert. Each crew had to ask for a latitude and longitude for the primary divert and the associated TACAN channel. Based on that event, I now questioned how familiar my squadron's aircrew were with the operating area's divert information. As the safety officer, I made sure the required divert information was well ingrained into the aircrew over the next few days, including location, navigation aids, field data and support facilities. Soon thereafter, the JO's "top 10" list materialized, which I found humorous. However, I realized the importance of reviewing proper procedures should we have trouble finding the tanker's basket, as was to occur that night.

I could say, "It was a dark and stormy night," but, actually, we could see great with NVDs, and we planned on staying above the clouds. METOC had briefed the weather would be "scattered to broken clouds from 8,000 to 25,000 feet, with scattered rain showers in the central and western portions of the AOR."

"Great," we thought, "right in the middle of all the tanker tracks."

After our brief and a review of the aircraft-discrepancy book, we again launched in support of the "shock and awe" phase of OIF. We easily found our front-side tanker with the help of the NVDs, but the tanker pilot wanted to stick to his assigned track, which meant going through (instead of around) cumulus clouds. We got our gas and proceeded to station. Along the way, we climbed, then climbed some more—all the way to a very untactical FL320. From there, we provided jamming support before leaving to find our midcycle tanker.

We had heard from another Prowler crew that the weather between FL260 and FL280 was workable, at least partly VMC. We had the E-3 clear the path in front of us, and we found ourselves descending and ascending between FL200 and FL300 to find VFR conditions. We finally found a clear altitude at FL260 and turned toward the tanker track.

One radio was tuned to the tanker-control frequency and the other radio directly to the tanker. The tanker crew said they were IMC at FL220. We got a sweet lock on him at 35 miles and asked the controller for a SNAP (bearing, distance and altitude). The tanker crew said they were climbing to FL240 because FL220 was unworkable. We got our SNAP from the controller and descended to FL230.

Looking at the "top 10" list, we had experienced Nos. 10, 9, and 8. Fortunately, we were not in a section, but we were about to experience numbers 4 and 3, although we were told no other tankers were in the vicinity. We had excellent comms with the tanker and the controllers as they fought to have a Prowler meet a VC-10.

I could see the TACAN quickly tick down, indicating a head-to-head pass was coming. As it ticked down to 1.5 miles, with no tanker in sight—we still were in the clouds at FL230 feet—I started to get worried. My pilot put on a hard turn, and we got an updated steer to the tanker, 180 degrees behind us. The VC-10 pilot tried various altitudes and headings but could not find a clear area. The tanker crew suggested we simply follow him via TACAN as he flew back to his base, and, if we broke out, then we could get our gas. With no other tankers available, this plan seemed like our final option.

I asked for another SNAP to our VC-10 and his heading. I noted the TACAN read 7.5 miles. From the information we received from the controller and the VC-10, the crew figured we were behind our tanker. We increased speed but watched the TACAN gradually increase, which did not make any sense, so I again asked for the VC-10's heading and airspeed. They were on our heading and about 50 knots slower than us. The controller swore that the VC-10 still was in front of us. About that time, we hit strong rain showers, and I swore to myself. Our squadron just had experienced a flight involving severe hail damage, so getting hit by hail was not good. The rain subsided occasionally but then came back with ferocity. Meanwhile, the TACAN still was increasing, even as we slowed. We had calculated our bingo number to be 4,500 pounds; we were showing 5,500 pounds. With the confusion over the tanker's location, and after dueling with the controller and the tanker, I asked, "OK, who has had enough of this?" My pilot immediately raised his hand.

We eventually correlated the TACAN with what the controller and the tanker pilot were saying. Finally, I realized we were probably on slightly diverging flight paths; hence, the increasing TACAN, despite our speeding or slowing. I cried "uncle" with 5,000 pounds remaining and announced we were diverting. My pilot climbed at 0.7 Mach to FL330, and we finally were above the clouds.

I told the controller we were "emergency fuel" and were heading to our primary divert. I knew that, technically, we gave up 500 pounds early, but I added a few

hundred pounds for my very pregnant wife (she gave birth to our twin boys four days later) and because the tanker duel had proved fruitless.

Knowing we had gas for our divert and plenty of tailwind, we flew via deconflicted routing to the divert field. I coudn't establish communications with our foreign air-traffic controller, so I switched up approach and the supervisor of flying (SOF) at our divert field. The SOF expected us, and he said fuel was waiting upon our arrival, and the ship knew our divert plan. Just as the SOF gave us that message, the clouds disappeared below us, and we could see forever.

My pilot was busy reading the approach plate and getting positioned for an idle descent, while I talked on the radios. As we descended, the approach controllers asked if we had the field in sight. All we could see were a bunch of lights perpendicular to our flight path. From our earlier review of the airfield layout, we knew the runways were perpendicular to our flight path. We correctly surmised the lights were from the airfield facilities. However, we could not make out the runway lights. We knew from the field diagram the runway was west of the facility lights. As we turned to final, the runway lights appeared, with our fuel now down to 2,400 pounds. We were going to op-check some of our landing items that had not been used in five months, namely the anti-skid and the flaperon pop-ups.

My pilot configured the aircraft for landing, and we immediately got an anti-skid light. Fortunately, it had not been raining at the airfield, and tower confirmed a dry runway. My pilot flew a low glide slope to touchdown, using the VASI-light system. The aircraft touched down on the dry runway, and my pilot and I reported good pop-ups to complete a successful landing. Ground control directed us to the transient line, where we shut down with 1,700 pounds of gas and no low-fuel light.

It took us longer to get the gas we wanted. We were out of practice for what amounted to cross-country rules. But, we got enough gas to get to the ship and thanked the Marines who helped us out. I had to blow the dust off my ground-based checklists. We got airborne and made our assigned recovery time to an OK 3-wire.

I would like to impress on others these points:

• Know your operating-area-divert information: latitude and longitude, runway and field data, and available navaids and communications frequencies.

• Communicate within the squadron and air wing. Many of the flights conducted during Operation Iraqi Freedom were flown in IMC and led to a number of diverts. I learned from others in the air wing some of the nuances of the divert fields that are otherwise not available from the publications. I then passed those lessons to others in my squadron.

• Compartmentalization can be critical. I always have felt comfortable with my ability and my crew's ability to compartmentalize, and this flight was no exception. Not only was the flight a combat mission, but my wife back at home was about to give birth. Yet, my crew and I knew exactly where we were and what we had to do to get home.

• Know when to say "when." I had heard of others getting below bingo fuel before finding the tanker, but I was not about to let that happen this night. Confusion as to where the tanker was, IMC flight, and rain, were factors that led our crew to say "when" at the appropriate time.

• Once the decision is made to divert, then divert. Our airborne controllers asked if we wanted to try to find a tanker south of our flight path. Knowing we really had 500 pounds of gas to play with (about five minutes), we declined.

• Crew coordination is always a factor in the EA-6B. I had our backseaters figure out our actual bingo fuel. Once we started the divert procedure, I let them know our intentions and kept them abreast of what we were seeing on approach.

• Be prepared. I always carry the necessary publications with me, regardless of the flight's length, complexity or location, and I thoroughly review divert data. Looking at the pubs for the first time at night or IMC on a bingo profile is not good preparation.

• Look for safety-of-flight clues any place you can. The JO's ORM "top 10" list, although humorous, highlighted our most prevalent risk during Operation Iraqi Freedom: IMC tanking.

Always assess the risks, and address those risks to best mitigate them, if not remove them completely. In-flight tanking will continue to be a challenge, especially in aircraft like the Prowler, which lacks air-to-air radar to facilitate rendezvous in IMC conditions.

Dependency on air-traffic controllers can be fatal if a fully developed plan of action has not been discussed. Knowledge of local operating areas and divert fields are a must, whether operating in the United States or in combat conditions. Can you avoid disaster when one of those "top 10" flights comes your way?

LCdr. Flynn flies with VAQ-131.

Crew Resource Management

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

By Lt. Erich Roetz

Here I am—airborne, on cruise for the first time in three years, and trying to get night qualified. What can go wrong?

As the mission starts, I realize I'm a little tired. I can't imagine why. Five days ago, I was an FRS instructor on the East Coast. Now, I'm briefing my second flight of the day in the central Mediterranean Sea. Knowing I am near my limits, I ask the aircraft commander (a pilot junior to me by about 1,500 hours) to keep an eye on me.

WHEN LIGH

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The mission is uneventful and almost over. We check through strike and into marshal; I had forgotten how quickly they pass the instructions. We start to experience poor weather, as forecasted.

As we head for marshal, my copilot asks for my airspeed. I respond, "200 knots, why?"

He replies, "I'm showing about 150 knots and decreasing." Uh oh, not a good sign.

When his airspeed reaches zero, I think, "No big deal. I've been single-piloted with students at the FRS for the last couple of years."

As we proceed to our marshal point, the weather gets worse. Our storm scope is on, but it is not a true weather radar. Only electrical discharges are displayed, and the scope shows nothing. However, we are getting bounced around pretty good. All I can think is, "Just fly attitude." It is getting darker, and I have no copilot instruments to back me up. It would be nice to have back his instruments.

The next thing I hear from the right seat is, "Hey, look at this," as he points to the windscreen. I see Saint Elmo's fire. Then everything goes white, I hear a huge crack, and the aircraft shakes violently.

I say the first thing that comes to mind, "I can't see."

My copilot then says the first thing that comes to his mind, "Whoa, I can't see either." Not good: Two blind pilots, and only one of us is an LSO.

As my vision slowly comes back, I stay on instruments. I feel I should state the obvious, "We were struck by lightning." Our next task is to determine what still works. After careful scrutiny, we realize we have all of our navigational aids. We then want to see if there is any structural damage, so we dirty up. Everything is going well, but still I can't see very well.

The copilot then exclaims, "Hey, my instruments are back." More good news, I think. Although I am happy his instruments have returned, I would prefer they hadn't come back than to have suffered a lightning strike.

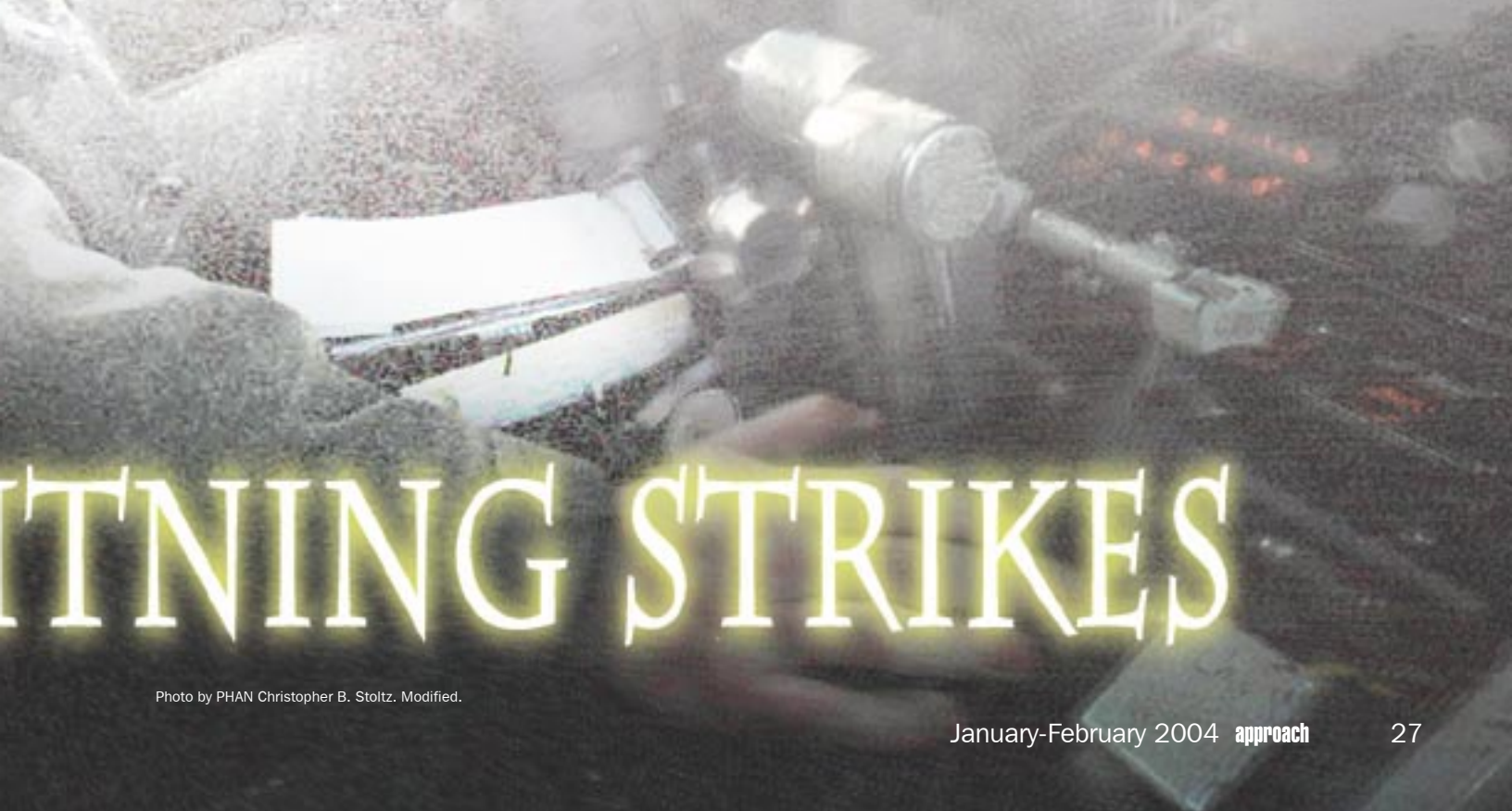
We fly around mom at 2,000 feet, which gives us more time to get back our vision, and we land for an uneventful night trap.

As we taxi out of the landing area, I remember something from primary that would have been useful 30 minutes earlier: Do not let anyone put you in a situation that is unfavorable to good aviation. If we had told marshal our radial was in the middle of a strong weather cell, we could have received alternate marshal instructions.

I still wasn't night qualified because I needed two night traps, so the Hawkeye rep asked if I wanted to swap aircraft to get a second night trap. My rough translation over the radio was, "No thank you."

That decision probably was the best one we made all evening.

Lt. Roetz flies with VAW-124.



TNING STRIKES

Photo by PHAN Christopher B. Stoltz. Modified.

Sauna in the Gulf

By LCdr. James C. Logsdon

As the safety officer, I had tasked many of the JOs to write *Approach* articles to share their learning experiences. After I returned from a "good deal" FCF, the JOs had returned the favor by tasking me (via the ready room white board) to write this article.

The Arabian Gulf becomes comfortable by early November. I was flying an FCF C in aircraft 300. The sky was clear and the typical Gulf haze was absent. The preflight, poststart checks and launch were uneventful. Immediately off the catapult, I noticed the electronic-control system (ECS) flow had increased in force and temperature. I continued the Case I departure, and checked the cabin-temperature set to full cold. I then selected ECS manual and saw another increase in flow. The air temperature was extremely hot—similar to jet exhaust on the flight deck. I reselected ECS to auto, and debated recovering immediately. I completed the cockpit-hot checklist to the step to secure the bleed air and eliminate the source of hot air. Considering the heat uncomfortable, but bearable for a 1+15 sortie, I chose to leave on the bleed air, and continue the FCF—I chose poorly.

On the climb-out, the cockpit was least uncomfortable when I ran the defog lever full forward. This setting directs the strong, hot airflow away from my torso, hands and arms, and toward my face and head (protected by the helmet, visor and mask). Selecting ECS to OFF/RAM and cabin pressure to RAM/DUMP

After trapping on the 3-wire, I thoroughly was confused and exhausted.

did not eliminate the hot airflow, but did reduce it the most.

The FCF checks were uneventful and completed within 20 minutes after takeoff. I continued the cockpit-temperature-high checklist, which I had shelved earlier, and climbed toward the ship. I estimate the air pouring from the ECS ducts was at least 150 degrees (NATOPS states with ECS switch to manual, the air temperature from the ducts can reach 190 degrees). The cockpit was hot, and before I did anything else, the signal-data computer (SDC) failed. This failure eliminated aircraft-fuel-quantity indications and rendered inoperative the integrated fuel and engine indicator (IFEI), except for engine rpm and temperature. The multi-purpose-color display (MPCD) also failed, but I could get the horizontal-situation indicator (HSI) data on the digital-data (display) indicator (DDI).

I contacted a squadron representative and reported the SDC failure and the hot cockpit. He asked if I had tried ECS in manual. I replied, "Yes, but that gives me a strong, insanely hot airflow."

The rep missed the significance of my comment. With the rep's assistance, I completed the cockpit-temperature-hot checklist. The next step was to secure the engine-bleed air. I did as directed, and the rep arranged a pull-forward recovery. He was concerned about the lack of engine and fuel information available to me. With the bleed

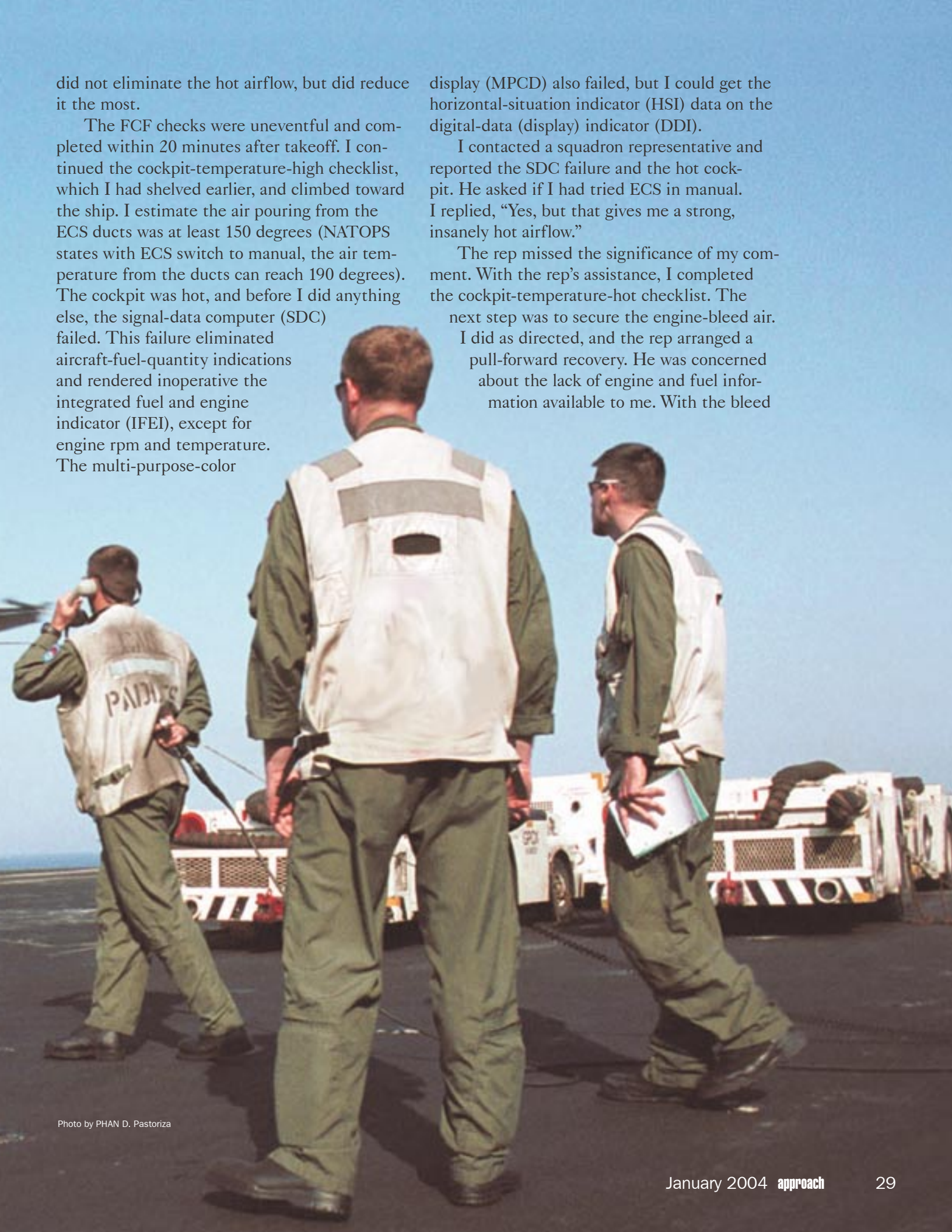


Photo by PHAN D. Pastoriza

air secured, I noticed the hot air had stopped pouring into the cockpit. Soon, I would feel more uncomfortable; the airflow had caused my perspiration to evaporate, keeping me relatively cool. At least I was cooler than I soon would feel.

While I felt changes in cockpit airflow, I didn't realize I still had been breathing on-board-oxygen-generating-system (OBOGS) air for the last minute or so. I felt confused, and then felt my oxygen hose slightly collapse while I inhaled. It then struck me, I was at 17,000 feet with inoperative OBOGS. I shut off the OBOGS and initiated the emergency-oxygen source. The rep and I had missed the significance of securing the bleed air while above 10,000 feet. This obvious consequence is not mentioned in the NATOPS procedures in the PCL.

After I went on oxygen, I descended to 2,000 feet, and aligned myself for recovery. I removed my oxygen mask when below 10,000 feet, and left it off for the remainder of the flight. It took about 10 minutes for the ship to prepare a ready deck. Meanwhile, I had to dump fuel to reach my desired landing weight. But, without any fuel indications, I had to determine an alternative method to reach max trap. The solution was to dump fuel until the aircraft was at the appropriate airspeed for 34,000 pounds. Our concern was to make sure I didn't dump too much fuel. As I configured the aircraft for landing, I realized the cockpit, without airflow, was sweltering. I engaged radalt hold and automatic-throttle control (ATC), and then held the dump switch, while S-turning behind the ship at eight miles. I had to hold the dump switch because of the SDC failure.

As I adjusted gross weight, the LSOs called to ask about my malfunction. I told them of the SDC failure, and mentioned the cockpit was very hot. I was sweating profusely and watched my flight suit turn dark green. The rep, while monitoring tower, asked whether my situation was debilitating or just uncomfortable. I was very uncomfortable, but I had no idea what "debilitating" meant at that time. I still was functioning, so I replied, "Uncomfortable."

I finally reached 141 knots (the speed incorrectly calculated by the rep for on-speed was 142 knots—the actual value should have been 139 knots, as configured), and reported ready to come aboard. I didn't feel well. I aligned with the ILS azimuth, and pushed over to capture glide slope. I backed up myself on the appropriate altitudes during the approach, similar to a night approach. I checked the heads-up display (HUD) to see the DME, but when I saw 3.6, I thought the ILS must be inaccurate. I should've been level until 3 DME, yet I was on the glide slope—not realizing I tipped over at 2,000 feet vice 1,200 feet. I was confused. Since everything looked right on the approach, I discarded the information I couldn't process and continued.

My breathing was strange. My breaths were long, shallow puffs, which worried me, because I was not controlling my breathing. Combined with the confusion and increasing fatigue, I now fully realized I was *in extremis* just inside two miles from the ship. I quickly reviewed my landing checklist, and to my dismay, found I was at half flaps versus full. I selected full flaps and wondered what else I had missed. On-speed was now about 133 knots at full flaps, and I had significantly less fuel than I thought. I wasn't sure about my remaining fuel, but there was nothing to do now. I thought about telling my situation to paddles, but I couldn't figure out what to say; I was on my own. My peripheral vision had diminished, and I began to fixate.

I flew a reasonable pass, basically staring at the ball. Fortunately, lineup was solved during the approach and didn't significantly deviate. After trapping on the 3-wire, I thoroughly was confused and exhausted. I was directed out of the landing area, figured I still was functioning, and continued to taxi. It did not occur to me to raise the canopy to let in cool air, or request to be shut down where I trapped. Instead, I taxied to the bow and back to a parking spot. Once parked and secured, I raised the canopy. A maintenance technician tried to talk to me over ICS, but he later said I was unintelligible. I don't recall this event, but I do remember feeling cold as the canopy was raised. I shut down the aircraft and climbed down the ladder. I essentially collapsed on the flight deck, consumed my water bottle, and awaited medical attention. After a brief rest, I was escorted to medical for examination and given intravenous fluids. The docs said my fatigue and confusion were caused by hyperventilation. The hyperven-

tilation was the strange breathing I had during my approach; my body's last-ditch effort to cool itself. This hyperventilation accelerated the dehydration process, but, the heat was the biggest factor in my seriously deteriorated condition.

The hot cockpit air was caused by an ECS duct-seal leak. The net effect was incompletely conditioned bleed air from the engine had poured into the cockpit. The hot-ECS air had damaged the SDC. The multipurpose color display (MPCD) failed from overheating, but was undamaged.

I should have discontinued the flight and landed with an immediate recovery. Instead, I chose to weather the hot air and continue the FCF. I did not secure the bleed air, because doing so would require emergency oxygen (a fact forgotten just 20 minutes later). The FCF was completed, I headed back to the ship, and prepared to continue troubleshooting the hot air until recovery time. The result was an SDC failure, which compounded the hot-cabin temperature.

The rep was concerned with the SDC failure, and missed the significance of the hot-cabin temperature. It was the SDC failure that met his threshold for a pull-forward recovery. He noted the high cockpit temperature, and had assumed I would let him know if it really was bad. He had heard when I said that ECS-manual selection caused insanely hot air, but he thought nothing of it. Different people easily interpret words differently. My voice inflection did not give him any clues to my deteriorating state, despite his being alert for such cues, especially after my communication with the LSOs. By the time such inflection would have been obvious, I effectively was beyond communicating: busy on the approach.

We, as pilots, understand the effect of system degrades and malfunctions on aircraft performance. However, no such metrics exist for pilot degrades. Asking me how I was doing, in this case, was akin to asking someone drinking alcohol if they still are sober enough to drive. In both cases, judgment is compromised. It was difficult for me to convey my situation at first, because I did not recognize the seriousness, and later, because I was unable to find the words. When asked to choose between uncomfortable and debilitating, I could not choose between those two extremes, and chose the answer in between. This answer was reasonably interpreted as merely very uncomfortable, but not life threatening. Otherwise, the rep would have considered recommending the jettisoning of the canopy before I lost consciousness. A better metric would have been to ask me to describe my performance on a scale instead of two extremes—like on a scale from 1 to 10. I might have replied with more useful information.

The most serious situation was the rapid deterioration of my faculties. The total time from feeling relatively well to being *in extremis* was measured in minutes. I have no idea why I selected half flaps when dumping fuel. Perhaps my mental performance already had deteriorated. I'm glad I caught it, prevented a wave off or injury, and avoided damage to the arresting-gear crew and engine. Fortunately, the rep had arranged the pull forward well before I was in serious trouble.

LCdr. Logsdon flies with VFA-113.

Wow! Talk about living on the edge. This aviator is fortunate he made it back alive. Obviously, he was dealing with a number of physiological issues, such as heat, hyperventilation, dehydration, and altered mental state. Any one of these issues could have been incapacitating, but, when combined, could have made a recipe for a fatal disaster. This article is an excellent example of how rapidly a situation can fall apart, requiring immediate action by the pilot to keep a mishap from occurring.

Let's look at two of these issues. The first is hyperthermia. Exposure to hot cockpit temperatures because of a malfunctioning ECS, combined with protective clothing that allows little if any airflow to promote cooling, and with rapid water loss due to profuse sweating, was a prescription for a mishap. Although incapacitating hyperthermia is rare, even mild heat stress in a flight environment is enough to cause confusion, exacerbated fatigue, and increased susceptibility to other physical-stress concerns.

The second issue was hyperventilation. This bodily reaction is a result of low blood pressure or a low oxygen state. Unfortunately, with the body's quest to increase the available supply of oxygen by breathing faster, carbon dioxide is exhaled, bringing on another set of problems that can compound an already bad situation.—Aeromedical Division, Naval Safety Center.

BRAVO Zulu

LCdr. Ken Germann and 2ndLt. Shane W. Alfar, USAF

LCdr. Ken Germann, instructor pilot, and 2ndLt. Shane Alfar, a student pilot, departed North Whiting Field for a T-34 fam flight. They had briefed oil-system malfunctions, chip lights, and how a precautionary-emergency landing (PEL) quickly can lead to an engine failure or high-altitude power loss.

They climbed to 8,500 feet and turned toward the working area to start their maneuvers with spin training. After passing Brewton NOLF to the west, a loud bang came from the engine compartment, followed by grinding and whining noises. An instant later, the master-caution and chip lights came on.

Oil and smoke spewed from the engine compartment. LCdr. Germann took the controls and turned for Brewton, about five miles behind them. The propeller slowed and headed for feather, while the engine kept groaning. 2ndLt. Alfar pulled out his NATOPS pocket checklist and reviewed the PEL and engine-failure procedures. As LCdr. Germann moved the condition lever to feather the propeller, he saw the generator light on the annunciator panel. The generator went off-line as the engine spun down through 47 percent.

The engine continued to spin down and wasn't providing power. LCdr. Germann cut off the fuel with the condition lever, while 2ndLt. Alfar pulled the emergency fuel-shut-off handle.

The crew notified Brewton crash crew of their engine-out and glider-mode situation. While descending, the crew discussed turning off all their equipment, except the UHF, to save battery power to lower the gear. 2ndLt. Alfar was ready to manually drop the gear if they couldn't electrically lower them. LCdr. Germann made one bowtie maneuver to lose altitude, and then electrically dropped the gear.

With oil spraying across the windscreen and down the side of the canopy, the crew left the canopy closed. The aircraft touched down 100 feet past the RDO cart, and rolled to a stop directly on centerline.

A 12-inch crack was found in the reduction-gear box, blades were missing from the power turbine, and P3-Py lines cracked from vibration.

LCdr. Germann is a reservist with Training Air Wing Five, and flies with VT-3 on annual training duty.

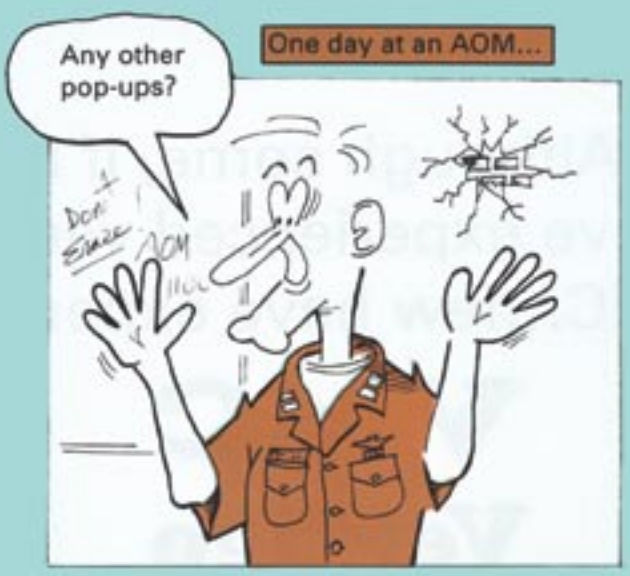
While on the flight deck, Capt. Michael McCloud, a CH-53E pilot, saw what appeared to be a crack in the first-stage blade of an AV-8B engine. Capt. McCloud confirmed this finding with Capt. Sam Clark, also a CH-53E pilot. Capt. Clark informed the squadron AV-8B quality-assurance officer. Squadron maintainers inspected and confirmed the cracked blade. Capt. McCloud's keen eye prevented the likelihood of an in-flight catastrophe. The engine promptly was replaced, and the aircraft returned to flight status.

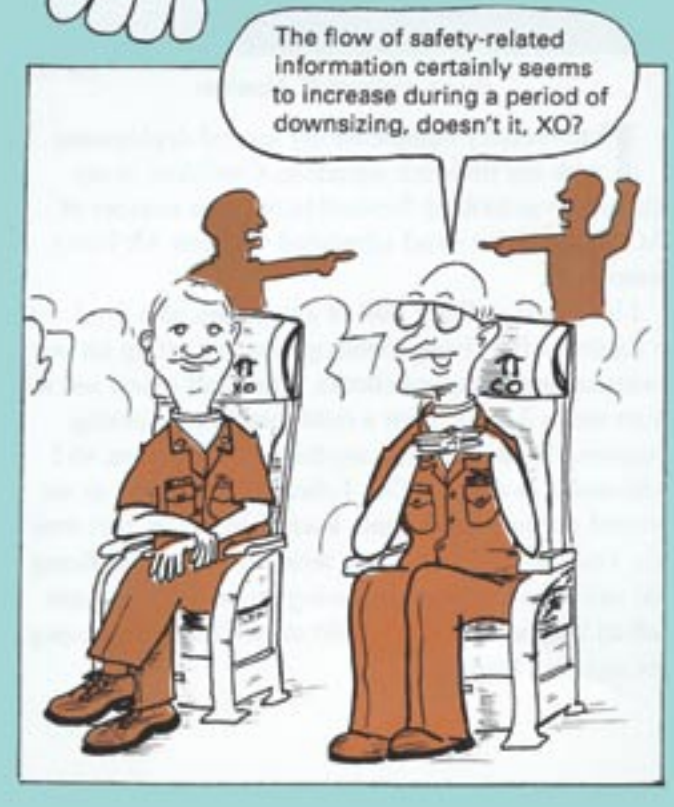
Capt. Michael M. McCloud, USMC, and Capt. Sam A. Clark, USMC

Classic BROWNSHOES IN ACTION COMIX

"The kind real aviators like"

By Lt. Ward Carroll





Ready Room Gouge

Photo by Fred J. Kinkenberger Jr.

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