THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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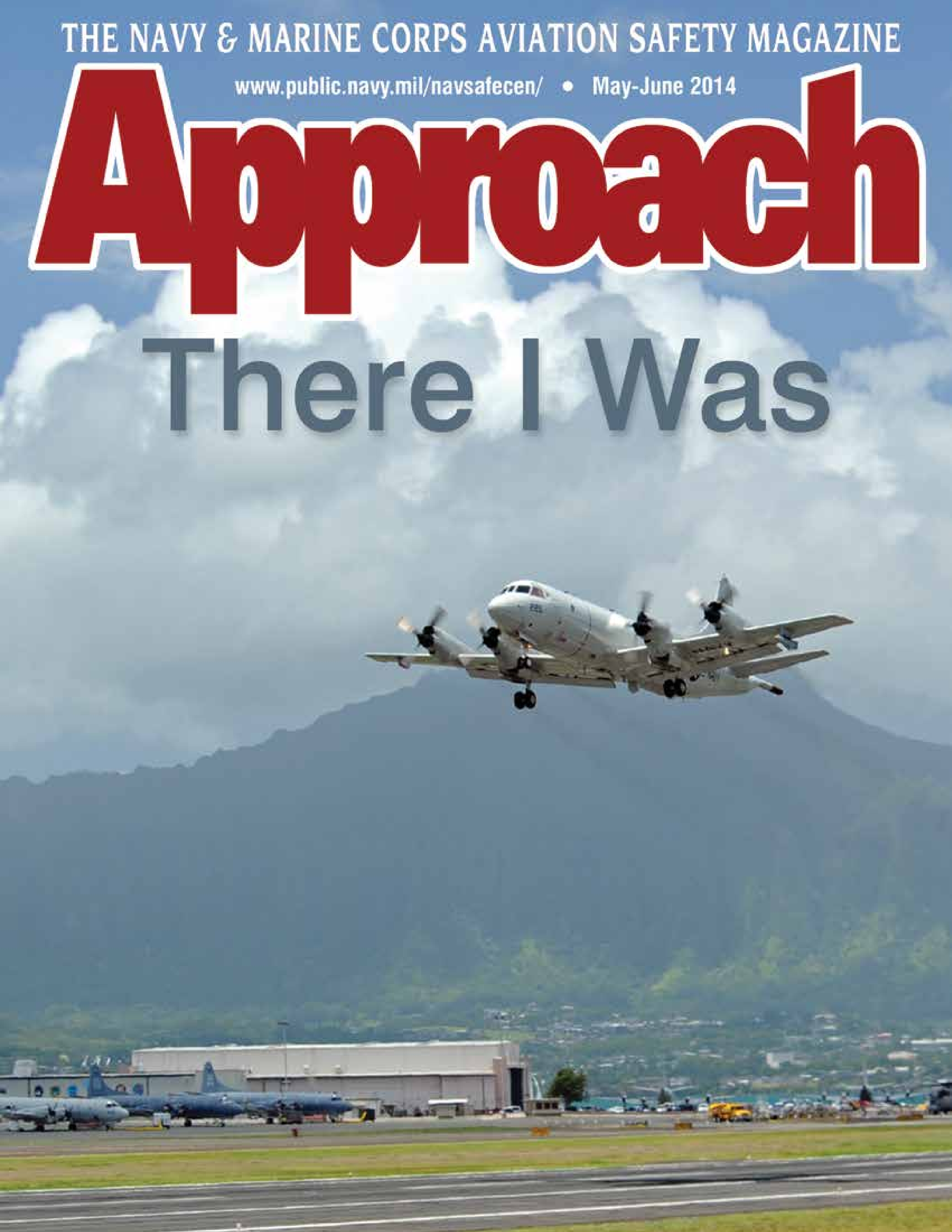
Approach

There I Was



The Navy & Marine Corps Aviation Safety Magazine

May-June 2014 Volume 59, No. 3

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

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CON

Features

Highlights from the Past

The first three articles in this issue are favorites of mine. The first puts you in the front row of a transpac and was the genesis of the "raven" on our front cover. The next shares insight into our Naval Aviation culture and success. The third discusses a place we've all been — welcome aboard! — Jack Stewart, editor.

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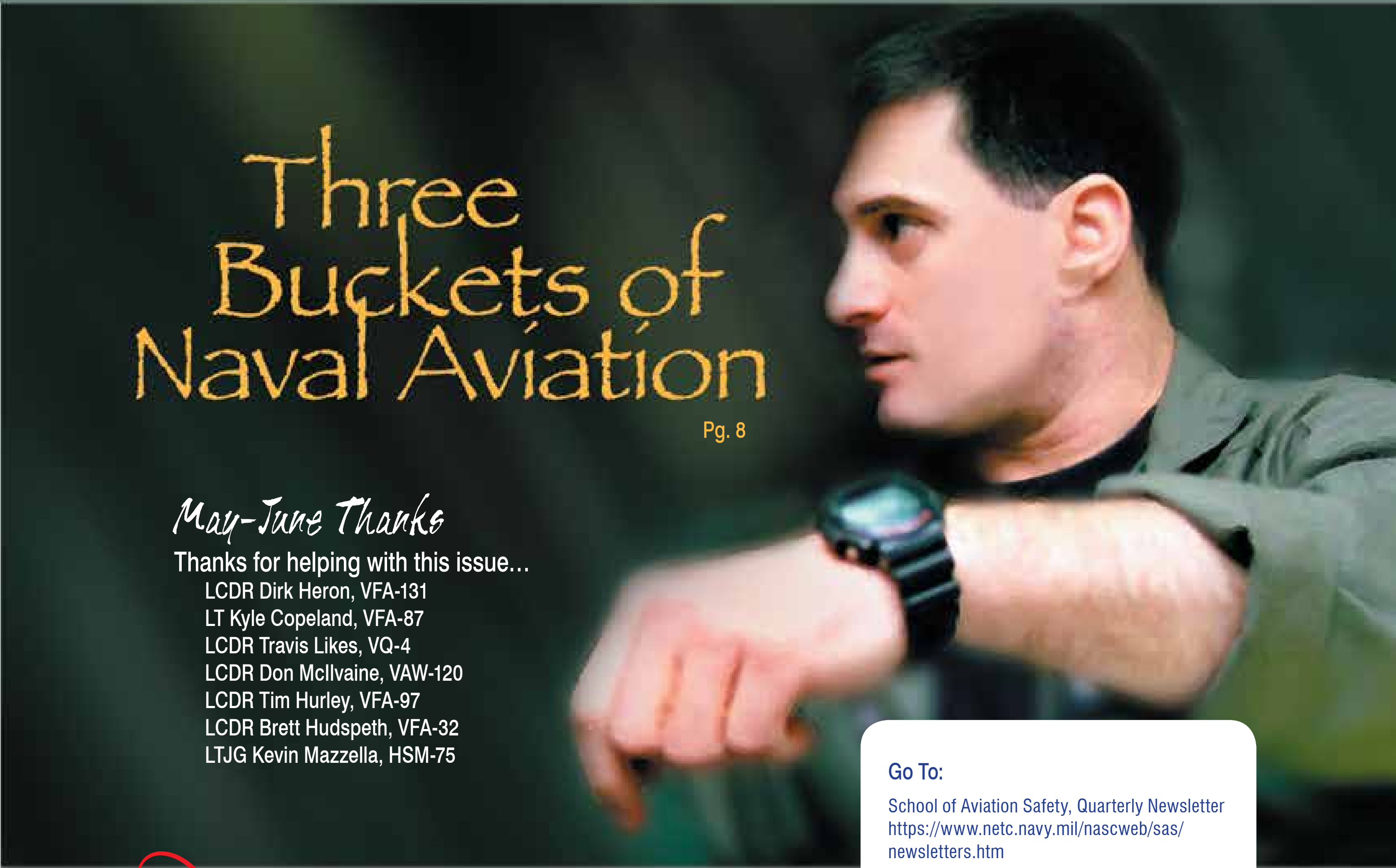

May-June Thanks

Thanks for helping with this issue...

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LT Kyle Copeland, VFA-87
LCDR Travis Likes, VQ-4
LCDR Don McIlvaine, VAW-120
LCDR Tim Hurley, VFA-97
LCDR Brett Hudspeth, VFA-32
LTJG Kevin Mazzella, HSM-75

Departments

Front cover: A P-3C Orion aircraft assigned to VP-4 takes off from MCB Hawaii.
Photo by MCC Keith W. DeVinne

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Editor's Note

"… The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood …"

The above line is taken from "The Man in the Arena," which was part of a speech entitled "Citizenship in a Republic," by Theodore Roosevelt, delivered at the Sorbonne, in Paris, France, on 23 April, 1910.

In Our Arena

I stood in front of the interviewer for the city of Rochester's teachers and was told that they had 300 applicants for every phys ed teacher opening. Reality check — I had just spent four years of college chasing a mirage. After spending a couple of years working in health clubs, I next found myself under the watchful eye of GySgt Henry Hill, USMC, at Aviation Officer Candidate School, Pensacola. (I swear that someone in my class wrote the storyline for "Officer and a Gentleman.") Just as you might expect, the PT stuff was easy, getting "yelled" at only mirrored some of my past coaches, but it was the academics that was the challenge (Yep, score one for the academy and ROTC folks, who already knew about headings, charts, camber, TACANs and some guy named Bernoulli). NATOPS was a whole new playbook.

I was in the arena and facing the fears, just as Teddy Roosevelt had talked about in his speech at the Sorbonne.

For 23 years my Navy adventure was as advertised, but not without several events that had me one hole short of a full lineup of holes in the Swiss cheese. A three-engine flameout (yes, I went P-3s), skidding sideways on any icy runway, and seconds from pancaking into a mountain are a few of the close calls. I've lost many shipmates in aviation mishaps. Our arena is a dangerous place.

When I retired from active duty, I went full circle and taught elementary school phys ed in Albuquerque, N.M. — absolute fun. But, coming to the Naval Safety Center was something I needed to do, almost like I had unfinished business to tend to. I hope I have given back to naval aviation, and I pray that my efforts and that of others who have a passion for safety have made a difference. I look at the lowering trend in mishap rates while I've been here with pride.

For the last 13 years and for almost a hundred issues, I've had the privilege to be the *Approach* editor, along with several *Mech* and special issues. I've never lost sight that our aviators and maintainers have dangerous jobs. I believe that our magazines and media products are a great resource to help you reduce the dangers and prevent mishaps. The trend in mishap stats is encouraging, and the credit belongs to all of you who have contributed to our media products.

I sincerely appreciate the support of everyone who has contributed to our magazines. You've shared your stories and your souls. The result is that safety culture we have in naval aviation is the envy of all. The aviation arena can be unforgiving and costly, but you're proving that we don't have to accept anything but success — by every measure. I know you will continue to move forward.

While I will miss a great team of professionals here at the Safety Center, it's time to move on to the next stage of my life. There's still so much to do.

There I was.

With heartfelt gratitude.

Jack Stewart

And finally, about the raven that has graced our front covers since September, 2001. An article in that issue, "Nevermore," by CDR Dave Delancey, prompted the idea to hide a raven somewhere on our covers. Ever since, Mr. Poe's bird has appeared in various sizes. Why? If you pick up Approach *to find the bird, then the next logical step is to open the magazine and read. That's it. Enjoy the original article—we've reprinted it on p. 4.*

Command Excellence Through Safety

The Chief of Naval Operations and the Commander Naval Safety Center are proud to announce the winners of the CNO Aviation-Related Safety Awards for CY 2013.

CNO Aviation Safety Award

These award winners are recognized for their professionalism, commitment to excellence, solid leadership and competent risk management which resulted in safe and effective operations.

COMNAVAIRLANT
VFA-81 VFA-83 VAW-120 HSC-2
HSL-48 HSC-7 VP-5 HSM-74

COMNAVAIRPAC
VFA-146 VFA-137 VAQ-138 HSC-21 VP-47
VAQ-142 VAW-113 HSL-49 VQ-1 VQ-3
VAQ-130 HSC-6

COMMARFORCOM
VMGR-252 VMFA-312 HMLA-467 HMHT-302
VMM-266 HMH-461 VMAQ-2 VMAQT-1
VMA-231

CG FOURTH MAW
VMFA-112 VMGR-452 HMLA-773 VMR Andrews
VMR Belle Chasse

MARINE CORPS INSTALLATIONS EAST
H&HS MCAS New River

MARINE CORPS INSTALLATIONS WEST
H&HS MCAS Yuma

CNATRA
VT-3 VT-10 VT-28 HT-8
VT-7 VT-21 VT-31

COMMARFORPAC
HMH-462 VMM-265 HMLA-267 VMFAT-101
VMGR-152 HMM-364 VMGR-352 HMLAT-303
HMH-466 HMLA-169 HMH-463

COMNAVAIRFORES
HSC-85 VP-62 VR-51 VR-53
VR-58 VFC-12 VFC-13

COMNAVAIRSYSCOM
VX- 23 FRC EAST

MARINE CORPS INSTALLATIONS PACIFIC
MCAS Kaneohe Bay

COMMANDANT OF THE MARINE CORPS
VMX-22

Naval Aviation Readiness Through Safety Award and the Adm. James S. Russell Naval Aviation Flight Safety Award

Presented annually to the controlling custodian that has contributed the most toward readiness and economy of operations through safety. The command selected must have an outstanding safety record, an aggressive safety program, and an improving three-year safety trend.

Winner: Fourth MAW

Admiral Flatley Memorial Award

To recognize the CV/CVN and LHA/LHD ships with embarked CVW or MAGTF, which surpass all competitors in overall contributions to safety. These teams are selected based on operational readiness and excellence, and an exceptional safety program and record.

Winners: USS *Harry S. Truman and CVW-3*
USS *Peleliu* and 15th MEU

Runners-up: USS *George Washington* and CVW-5
USS *Wasp*

Grampaw Pettibone Award

Presented annually to individuals and units that contribute the most toward aviation safety awareness through publications and media resources.

Unit award: Winner: VAW-121
Media award: Winner: HT-18
Individual award: Winner: Capt Byron Drader, USMC, VMAQT-1
Runners-up: LT Ken Dittig, VT-86; LT Monica Mondloch, HSC-25

Reprinted from September 2001.

Nevermo

BY CDR DAVE DELANCEY

Anyone who has spent time at NAF Atsugi knows all about the ravens. Thousands of them caw raucously, from the golf course to the flight line. They wake you every morning and are still at it every evening. Early last month, I could have sworn I heard one whisper, "Nevermore."

I'm a Navy C-9 pilot, a 20-year commander in the Navy Reserve who also flies as a captain for an airline. My time is equally split between my civilian and military jobs. I spend months each year in Japan or Italy, flying passengers and cargo for the Navy.

Last month,we were tasked to fly from Atsugi to Phuket, Thailand, stay overnight, fly a leg to pick up a SEAL platoon, bring them back to Phuket, spend another night, and then return them to their forward deployed home base in Guam. This was an unusual but not unheard-of mission for a C-9.

The mission went fine all the way back to Phuket on the second night. Gas started to become an issue when we had both of the SEAL det crews and their combat cargo on board. That extra weight limited the amount of fuel we could carry to about 30,000 pounds (four and a half to five hours worth).

Three tropical depressions were beginning to stir in the Far East. One was up north, to the west of Korea; it wasn't a factor. But one was sitting just to the west of the Philippines and was slowly drifting east toward Manila. The third, named Samoi, was spinning up to the northeast of Guam and sliding northwest. Its projected track would keep it 200 miles north of the island. Not forecasted, it soon would accelerate to super typhoon status.

Phuket, Thailand, is an international resort (where the movie "The Beach" was filmed), so while overseas communication was expensive, it wasn't impossible. Worried about the weather, I made several long-distance calls to our scheduler and various weather agencies around the area. We would beat the first typhoon into Manila with a day to spare.

With the SEAL team on board, we departed Phuket airport early that morning. About 200 miles into the flight, the first thunderstorms started to appear, and we switched on the weather radar. It didn't work. It had tested fine on the ground and in the air, but it wouldn't show us the storms. We made the only decision we could and turned around to get it fixed. We carry our own mechanics with us, and an hour and a half later, back on the ground in Phuket, they found a broken wire. We fueled the aircraft and started off, now more than two hours late.

re

I tried to decide what to say in the voice recorder right before we crashed.

The weather into Manila was dicey but manageable. We used the radar to skirt the worst of the storms on our way in from the west, and found clearer weather as we approached the field. The leg took three hours and 40 minutes, and we landed with 6,500 pounds of fuel, just above the legal planning limit of 6,000 pounds.

Again we refueled. We were losing daylight by flying east, and it was now dusk in the Philippines. Again, I hauled out my credit card and called to recheck the weather. There was a chance of light rain later that evening in Guam, but we didn't expect any real problems. The next leg was projected to last three hours and 20 minutes, so we were confident we'd have fuel to spare. There are two major airports on Guam, even though it is a small island. This is important for a C-9, because almost every time we fly to an island, we don't have enough fuel to go anywhere else. That was certainly true this night. This leg was business as usual, legal by every naval aviation regulation. I would have flown it with my family in the back.

We took off in the deepening twilight, maneuvering to avoid the storms that the radar picked up with increasing frequency. A commercial pilot talked to us on an air-to-air common radio frequency; he told us he had just taken off from Guam, and that we should have no problems. We pressed on, oblivious to the havoc Samoi soon would unleash.

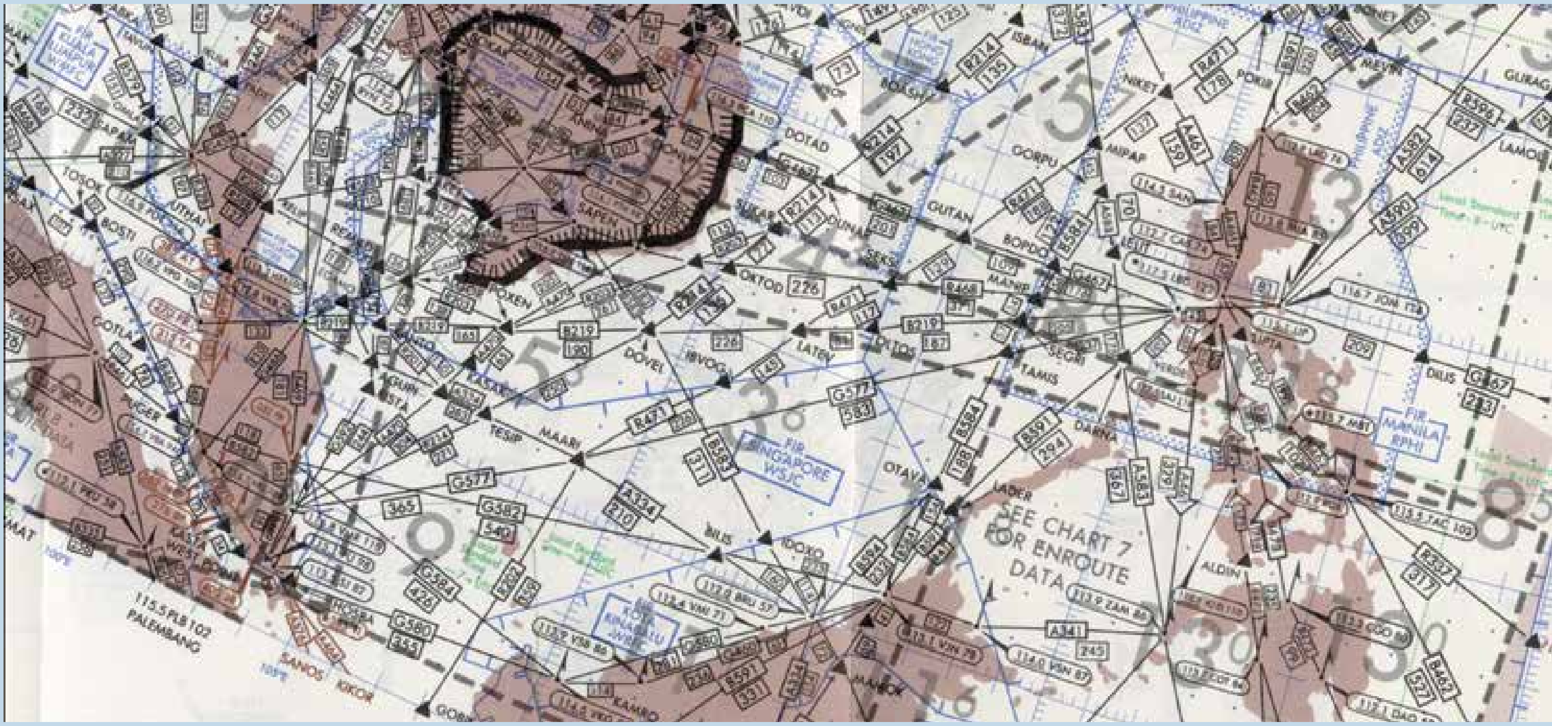
We approached Guam at 10 p.m. There was no ATIS—the field had closed because of the worsening weather. Approach control was still up and running. We arrived overhead with 7,500 pounds of gas, about what we had expected but certainly not enough to go anywhere else.

Typhoon Samoi had slowed and moved south. Counterclockwise, swirling bands of severe thunderstorms had begun to fill in on its backside. Though the storm center was 150 miles to the north, the typhoon encompassed an area 600 miles across and 1,200 miles long.

Both airports in Guam have long, dual runways that run from northeast to southwest. The wind that came roaring in with those backfilling storms was almost straight out of the west, at times reaching 80 knots. Those treacherous winds kept us from shooting an ILS approach. A precision approach would have placed us well outside the tailwind limits for the aircraft.

We set up for the TACAN 24, non-precision approach to Anderson Air Force Base. We would come in over the

Photo-composite by Patricia Eaton



ocean, cross a cliff several hundred feet high and touch down on the runway atop the cliff, less than a half-mile from the edge. On a clear day, it can be an eye-opener. On a night like this, it can kill you. One windshear downdraft at the wrong time and not only will you not clear the cliff, you might never see it coming.

If you've ever had to pull your car to the side of the road during a heavy downpour, you can relate to the conditions that night. Now imagine yourself moving at 150 miles an hour and not being given the luxury of stopping. The rain was horizontal. We could not see three feet ahead, let alone the half-mile required to land at that speed. On the first approach, an 80-knot windshear took our speed from 150 to 230 knots in two seconds. A go-around was mandatory.

The second approach had a little less windshear. The radar showed nothing but red on the 30-mile scale. We normally don't even fly through red, let alone land in it. According to Approach Control, we had been over the end of the runway both times, but we never saw a thing. Fuel was now 5,000 pounds.

I was ready to start bending the rules because I had to get closer to the ground to have any chance to land. I opted for a downwind ILS, landing in the opposite direction. We began the approach with the autopilot locked on ILS, despite the out-of-limit winds. The GPS showed a 40-knot tailwind (the limit is 10), but I was out of ideas. At around 250 feet, we got the one that always gets you in the simulator: the minus 40-knot windshear. You instantly lose the airflow over the wings that keeps you airborne. The aircraft can stall and fall and there is nothing you can do about it. Our airspeed went to around 100 knots. We would have died if it had reached 95. I clicked off the autopilot and shoved the throttles to the stops, trying to initiate a textbook windshear recovery. I actually saw runway lights at one point. But we couldn't land with that combination of airspeed, windshear and visibility. We would have crashed on the runway. We went around again.

I got clearance to Guam International, 20 miles away. The fuel was now 4,400. We declared minimum fuel. Approach asked for "souls on board," and we knew that was so they could tell the rescue teams how many bodies to look for. The controller said his radar showed the weather getting worse.

We were cleared for our fourth approach, a VOR/TACAN 24 to Guam International. So far, all the approaches had been backed up by the copilot, using homemade GPS approaches, and he was calling out centerline deviations. I had been flying real instruments, not computer-generated ones. Approach called the position of the actual terrain obstructions (to our left) and gave us unofficial help for centerline, although he did not actually have "precision radar" and could not

"legally" do it. I recognized his calls for what they were and started cheating 50 to 100 feet on the minimum descent altitudes. We still couldn't see anything forward. We went around again.

The TACAN went out of service sometime during the go-around, so we were cleared for the NDB approach to runway 24, the only one left for us to use. The fuel gauge read 2,800 pounds. Going around is not recommended below 1,500 pounds in the C-9 because the deck angle may cause the engines to flame out. We turned on all the fuel-tank pumps, even in the empty tanks, and opened the fuel cross-feed. We had been over the end of runway every time; we just hadn't been able to see it. We went around for the fifth time.

We had enough gas for one or two more tries. I tried to decide what to say in the voice recorder right before we crashed.

As we asked for early turn-in vectors to the NDB, the crew chief (whose birthday was that day) asked, " OK guys, what are we going to do now?" I decided to couple up the NDB approach on the GPS computer with the autopilot—an unauthorized, untested technique that allows the computer to fly the aircraft without outside reference. I flew to 100 feet below the approved minimums on autopilot-altitude hold. This allowed me to look outside without concentrating on the instruments. We drove in and caught our first break, a gap in the waves of thunderstorm cells rolling across the island. We saw the ground, and, for the first time, saw the runway at three-quarters of a mile.

I immediately clicked off the autopilot and dove to 100 feet to avoid any possibility of going back into the clouds. We were still in moderate rain. In close, I pushed it over. We picked up a 40-knot windshear 30 or 40 feet from the end of the runway. I continued to push the nose down, willing to have it hit if I had to, but I managed to level out at five feet and, incredibly, ended up with a smooth touchdown. The antiskid released several times as we hydroplaned on the rain-soaked runway. We stopped on centerline with 3,000 feet remaining. We sat there for a minute. Then the torrential rain closed back in, and I could not see to taxi. The fuel was 2,000 pounds. Riotous applause erupted from the back. They had known we were in trouble, but the three of us in the front knew we had enough gas left for only one more pass.

Thirteen civilian airliners had received the same weather report as we did that night. They all started out expecting to land at Guam, and they all carried enough fuel to divert to Tokyo, Manila or Okinawa. In other words, they had an extra 30,000 pounds of gas. That's what we had started with. All 13 diverted to their alternates, some before an approach and some after. We were the only aircraft that made it in that night (or the next 24 hours).

Around midnight, as we pulled into the gate, our crew chief looked around the cockpit and said, flatly, "Well, it looks like I survived another birthday."

We parked with 1,700 pounds of fuel. The APU flamed out 45 minutes later. We actually had less than 500 pounds of usable fuel remaining on touchdown.

Will I ever fly around the Far East with the Navy again? Absolutely. Will I ever fly to an island destination that has a tropical depression nearby? Not on your life. Sometimes even your best isn't good enough.

Three days later, we made our way back to Atsugi. As we shut down and walked away from the aircraft, I turned around. Sitting all by himself, up on the tail, was a big, old black raven. I could swear he winked at me and whispered, "Nevermore."

WHEN HE SUBMITTED THIS ARTICLE, CDR DELANCEY WAS A C-9B PILOT WITH VR-52.

Reprinted from November 2001.

Three Buckets of Naval Aviation

This old guy obviously had been to those faraway places where few men boldly go, and fewer still return from.

Photo by PHAN James K. McNeil
Modified by Allan Amen

BY CDR STEVE BAXTER

Many years ago, as a flight student, I was fortunate to have more than my share of good instructors. They would offer advice, encouragement and when needed, a healthy dose of motivation. Each had his own style. Some used soft-spoken, clever phrases. Others favored vein-popping, ICS-distorting tirades.

One teacher took a moment out of his busy day to explain his three-bucket theory to me. This old guy (he must have been nearly 30) obviously had been to those faraway places where few men boldly go, and fewer still return from.

He held my undivided attention when he mentioned the three buckets of naval aviation during a debrief one day. After all, my pink sheet was sitting within reach of the black-and-silver Skilcraft resting in his gnarled paw.

"Let me tell ya about these buckets," he said, saltiness and JP-5 dripping from every word. "Yes sir," I squeaked.

"These buckets are standard issue once ya get to your first fleet squadron. You carry them with you every day for the rest of your career." His eyes reflected the pain of 11 months on Yankee Station, so I knew he spoke the truth. I had no idea what he was talking about (my mind still raced from shooting sloppy point-to-points an hour earlier).

"The first one," he said, "is called the experience bucket. That one, when ya first get it issued, is empty. Nothing in it. Not a drop." I figured that made sense. I knew I had a long way to go from my radial interceptor to a fleet airplane, whatever that was going to be.

He continued, "The experience bucket begins to fill from the moment you walk into your first ready room, whether you know it or not. Every time you go to work, it gets a bit fuller." I was beginning to understand. He took a sip from a stained coffee mug and a long drag on an unfiltered cigarette. "As it fills, whatever is in there is available to use when you might need it, later on."

I ASKED WHAT HE MEANT BY THAT. "You see, while waiting in marshall on some dark and scary night in the IO, you'll need that pail. You'll reach into it, and the knot in the pit of your stomach will get a lot smaller, trust me." He mentioned something about a slider at that point, but I figured it was some term from the olden days.

"The second bucket is labeled knowledge. Just like the first one, this one is empty when it's issued."

"How do I fill this one up?" I asked, in my whiney, ensign voice. I didn't like the answer.

"This one is not like the first. This one you can only fill by hard work and study," he replied. I was disappointed — I thought I was done studying once I got those Wings of Gold. He talked about stuff like NATOPS, 4790 and a bunch of other pubs that I pretended to know. I just figured I'd put the names in my experience bucket and pull 'em out to impress some other new guy.

"That knowledge bucket," he went on, "will really come in handy. Scary thing about that one though."

"Jiminy," I thought, "if he says it's scary, what's next?"

The lieutenant continued. "With the knowledge bucket, if you don't keep it refreshed by study, it begins to dry up. It'll go completely empty if you don't work at keeping it full. When you need to reach into it and it's empty, you'll be in a hurt locker." I didn't know what a hurt locker was, but I was pretty sure I didn't want to be there. I made it a point to begin filling up my knowledge bucket ASAP (I had learned that acronym earlier that day).

He continued, "The third bucket is labeled luck. This one, unlike the other two, is filled to the brim on the very first day you get it." Interesting, I thought. "The luck bucket is the one you don't want to reach into very often. Unlike the others, once you take something out of the luck bucket, it's gone. Can't put it back. It's much better to reach into one of the other two and leave this third one for those times when you really need it." Sounded like good advice. "I've had to reach into that last one a couple of times," he said. His eyes kind of glazed over, and I could have sworn I heard the razor-sharp growl of a missile-tracking radar. "Anyway," he returned from that faraway place, "you don't want to reach into that luck bucket when the other two are sitting there right next to it."

I left the debrief without a pink-sheet that day, but I figured the two "belows" I got for those tortured point-to-points were worth it. Sure, I had learned a thing or two about radial-magnetic indicators and that the tail rises (or does it fall?), but I was more intrigued by the three-bucket theory. For just a little while, until my next flight, I felt as if I was slightly ahead of the power curve (I had learned that term earlier, too).

WHEN HE SUBMITTED THIS ARTICLE, CDR BAXTER WAS THE COMMANDING OFFICER OF VAQ-136.

Reprinted from April 2002.

Welcome to Naval Aviation!

BY LTJG BRANDON SCOTT

I'd always heard the fleet stories from salty training-command instructors about how bad it can get flying around the ship, but I never believed it was much different from flying around the field. I always thought they were embellishing the stories to get us students to take training seriously. I can't tell you how many times during those instrument simulators that I heard the phrase, "Someday you are going to be behind the ship, at night, in a terrible storm, and will have to fly the best approach of your life to get aboard. There isn't going to be anyone with you to pimp you to do this or that."

I always thought, "Yeah, yeah, yeah. I've flown in bad weather before; how much different can it be?"

So, there I was, a nugget in a Hornet squadron on my first at-sea period. It was the second week of COMPTUEX, and I still was getting familiar with flying around the ship. My flight that day was an ADEX (air-defense exercise) mission with the skipper. We still were in the presence phase of the exercise, and our mission was to intercept and to escort the bad guys. Before starting the mission, we were scheduled to receive gas from a KC-135 overhead the ship. Getting gas from a KC-135 is never much fun, and the skipper suggested I put my drop tanks in stop transfer before takeoff. Hornet drop tanks can take longer to fill than internal tanks. With the drop tanks in stop transfer, all the fuel would be sent to the internal tanks, meaning less time behind the tanker.

My takeoff was delayed for minor problems, and the skipper launched first. After launch, the skipper called me on our aux frequency to say the tanker wasn't on station. That was a big relief. I reached down and flipped the tank-transfer switch to normal transfer, as I headed to our cap station.

Just as I flipped the switch, all my displays blinked, and cautions started popping up. I had problems with fuel pressure and invalid fuel-tank quantities. These problems got my attention because we now were on an hour-and-a-half cycle with no tanker gas. Around the ship, as I was learning, you always are concerned about fuel, even in a double-bubble Hornet.

As I headed toward my cap station to join the skipper, I saw my fuel indicators were frozen. "Not too big a deal," I told myself, "I'll just tell the skipper what I have once we join. After all, we just launched, and I have plenty of gas." I checked my bit page and saw the cause of the problems was a signal-data-computer (SDC) failure.

I was 15 miles away from joining when the skipper committed on the first bogey group. Well, the middle of an intercept is no time to talk on aux frequency, and I didn't feel the fuel cautions were a pressing issue, so I decided to keep quiet until the intercept was over. I finally joined on the skipper after chasing him through a few broken cloud layers, and we rendezvoused on the bogeys. We were hanging out behind the bogeys waiting for instructions, so I told the skipper what I had. Our controller told us to break off the escort, and he vectored us to get gas from an S-3. While fueling from the Viking, I mentioned to the skipper that I couldn't tell how much gas was received. He decided we should knock it off and head to the ship. The problem was my drop tanks still indicated full, and I had no way to know if they were transferring. The ship controller considered this info and decided it would be best to have me divert to Roosevelt Roads, Puerto Rico.

"Divert? Don't they know I'm a nugget? Oh well, so much for an easy flight," I thought. I dug the approach plates out of my nav bag. I eventually landed safely and wondered when I should go back to the ship.

After calling the ready room, I found out the squadron had sent another jet with a spare SDC. The plan was to replace the bad one and return to the ship that night. Upon arriving at Roosevelt Roads, the pilot who had flown in said the weather near the ship was getting bad, and flight operations were cancelled for the night. If we didn't get back soon, we would be spending the night on land.

The idea of spending the night in Puerto Rico didn't sound too bad to me, when compared to flying back to the ship at night in a thunderstorm, but the decision wasn't up to me. It didn't take long to change the SDC, and we were on our way.

We launched as singles, so we wouldn't have to fly in bad weather as a flight. As I flew off into the pitch-black night and got tossed around by some turbulence, I started to remember those stories from my training-command instructors.

Eventually, we contacted the ship, and they gave us a descent to 1,200 feet. That sounded great to me. We'd be on deck in a few minutes. When I was 30 miles away, I decided to dump down to max-trap fuel weight. I just had reached for the switch when I heard, "Ninety-nine, all aircraft max conserve. Hold overhead mother, max conserve!"

I thought, "What? I just came down out of that stuff, and I certainly don't want to go back into it and hold!" As we climbed back into the storm, we had moderate-to-severe turbulence with driving rain. Although both pilots tried, it became apparent there wasn't a good place to hold around the ship. The rain was so loud I hardly could hear the radios and we saw lightning every few seconds.

After what seemed like an eternity, the ship finally cleared us for our approach. The other aircraft went first and was not able to call the ball until one-half mile. That didn't sound good, so I thought about flying "the best approach of my life."

When it came my turn, I chased line-up all the way, and I broke out well right. When I went low on the correction to centerline, the LSOs had enough, and I got the, "Eat at Joe's" waveoff lights. "So much for the best approach of my life," I thought. My second approach was much better and I got aboard safely. I just was glad to be on deck and proudly walked across the flight deck in the pouring rain. When I got to the ready room, the skipper was standing there with his hand out. As I shook his hand, he said, "Welcome to naval aviation!"

The rain was so loud I hardly could hear the radios and we saw lightning every few seconds.

As for lessons learned, I finally appreciated all those boring instrument simulators, which I dreaded so much in the training command. I also was glad I had looked over the diverts before needing them. A few days later, a door-3 fastener came loose and shot down my right intake, FODing the engine. I had to bring the jet back aboard single engine.

In one week, during my first at-sea period, I had diverted to an unfamiliar airfield, made a single-engine landing at the ship, and had flown back aboard at night in one of those notorious thunderstorms you hear about in the training command. One piece of advice for those about to become nuggets: Don't relax because you finally made it to the fleet; the real test is about to begin!

WHEN HE SUBMITTED THIS ARTICLE, LTJG SCOTT FLEW WITH VFA-86.

DON'T TOUCH NOTHIN'

BY LCDR JAKE HUBER

I was relieved to be back aboard the ship after a six-hour OEF mission. The plane was secured to the deck, and I was ready to shut her down. I reached for the ejection seat ARM/SAFE handle and gave it a tug, but nothing moved. The handle was stuck in the armed position and the seat couldn't be safed. I gave the handle another tug. The components of the seat started to bend, but the handle refused to pop into the SAFE position. Now what?

I thought about time critical risk management (TCRM). I called for a troubleshooter, and he plugged into the jet. We discussed the situation and possible corrective procedures. His first suggestion was to examine the ejection-initiation handle between my legs to see if it was partly actuated. I looked at the handle but was apprehensive about touching it. I envisioned myself getting three swings under the parachute after manipulating the handle a little too hard. I slowed down and thought about doing everything step-by-step.

A running jet with no pilot was the first hazard my maintainers would face should I abruptly depart from the cockpit, so I signaled to shut down. Next, I notified the plane captain (PC) to get everyone away from the aircraft while I worked on the handle.

Ensuring all my harnesses were snugly attached, I grudgingly turned my attention to examining the ejection handle. It did seem loose, and I could see that it wasn't securely seated. I tried to push it back down into its housing, but it wouldn't snap into place. I asked for the ejection-seat safety pin and tried to insert the pin while forcing the ejection handle into the normal position — no luck.

The troubleshooter asked to climb up on the LEX next to the cockpit to see if he could fix the problem. I stopped and thought about the list of hazards that were accumulating: armed ejection seat, open canopy, and the troubleshooter leaning over me to work on the handle. Reluctant to put another person in danger, I continued my efforts to reseat the handle, but it wouldn't safe. The preface of the NATOPS manual advises to use sound judgment when encountering issues outside of normal circumstances; I was in the sound-judgment zone of operation. Admitting defeat, I carefully unstrapped and exited the cockpit.

I was greeted at the bottom of the ladder by one of the squadron AMEs. He was very confident he could fix the problem with low risk of the seat firing. I gave him my vote of confidence, but asked him to work on the ejection handle without putting any part of his body over the seat if possible. Within a few short minutes he was able to reseat the ejection handle and safe the seat.

There are times when you have no choice but to accept risk. The TCRM process was helpful because it made me slow down and think about the available solutions to my problem. I then thought of all the things that could go wrong with each required action and chose the safest option.

LCDR HUBER FLIES WITH VFA-131.

Give It Another Look

Procedures are in place for a reason, usually because aviators learned lessons the hard way and adopted procedures to ensure mistakes are not repeated. The little things most aircrew do typically have either a safety or performance component to them, even if it's just a way to mentally prepare for a flight. Habits you learned during flight school and the FRS shouldn't disappear after you become the person in charge of an aircraft.

BY CAPT BENJAMIN CARLTON, USMC

It was a nice January day in North Carolina, and I was testing an AH-1W after it had come out of phase maintenance. This helicopter had been in a test status for a few weeks, and had given maintenance a fair amount of trouble. Just when you thought the aircraft was going to be in good working condition, something unrelated would break. Progress had been made over the previous couple weeks and there were only a couple flight regimes left to verify before that bird was back on the flight schedule.

If you hear it from them, a maintainer's job is to fix the aircraft that the reckless pilots break. So naturally, as a pilot, you relish every opportunity to sign off a downing gripe and create another up aircraft. There was no rush to get the bird back on the flight schedule. We still had plenty of aircraft available to meet the flight schedule and have backups. We also were at home in coastal Carolina and not in a place where the squadron was supporting troops in contact with the enemy.

The morning went well, and after two runs the main rotor was in track and balance. The only thing left to do was to verify that all the vibrations were within limits and check that the rotor would build turns in an autorotation. I took off with a crew chief in the front seat and flew the relatively benign maneuvers necessary to complete the tests: straight and level at 120 knots followed by a constant speed autorotation where I recovered by 700 feet.

After completion, I headed back to home field believing I would sign off the completed test card. The flight seemed normal, and the crew chief and I were confident we would be done testing as soon as we landed. Neither of us noticed any abnormal control feedback or heard anything out of the ordinary.

When landing, the crew chief loaded the disk used to record the vibrations to verify everything was within limits before the bird was secured for the evening. I talked with Quality Assurance to let them know how things were progressing. Looking at the flight data, they discovered one of the regimes didn't record any information, and we would have to fly again to ensure the test had passed. The crew chief grabbed a couple of new floppy disks, and we headed back out on the flight line to give it another run.

I told the plane captain what we needed to do and

started climbing into the cockpit to take off. I realized I hadn't done a walk-around and paused momentarily to debate if it was necessary. No adjustments had been made to the main rotor head, and no maintenance had been done on the plane. I had landed only 15 to 20 minutes earlier, and I was sure everything was exactly as I had left it. But having heard stories of mishaps that happened because people failed to do a proper walk-around and because like most, I'm a creature of habit, I climbed down to inspect the bird one last time.

The plane captain saw what I was doing and ran ahead to help speed up the process. He was a few panels ahead of me when he said, "Sir, you should probably come look at this."

I walked over and looked at the cowling between the engines. There was a screw embedded in the cowling above the tail-rotor drive shaft, flush with the carbon-fiber panel. It was obvious that it had lodged itself with a great deal of force. We looked down the drive shaft for signs of a missing fastener or damage to the drive shaft, but we couldn't find any evidence indicating where the screw had come from. Expanding our search to the rest of the aircraft led us to discover a missing screw from the left side of the aircraft above the engine cowling. We couldn't figure out how it could have struck where it did.

After more examination, we found two small holes in the tail rotor. Somehow the screw had done its best magic-bullet impression, crossing in flight from the left side of the aircraft to the right, where it struck the tail rotor. Then it must have propelled forward before embedding into the carbon-fiber splitter cowling that lies between the engine exhausts.

Things happen in aviation even when everyone does their job correctly. The forces put on the airframe itself and the natural vibration caused by rotating parts put stress on the aircraft's components, which may eventually cause them to break. This is why we have inspections — formal and informal.

Most people in the military want to do their jobs well and finish in a timely manner to make sure readiness remains high. However, when people rush to finish a job or change habit patterns to save a little time, the potential exists for vital steps to be missed or for people to see what they expect or want to see. If I hadn't conducted the walk-around, the screw could have dislodged and been flung across the flight line, possibly injuring a Marine or worse. The damage to the aircraft could have become more severe and caused a mishap.

Nothing we do in training is worth putting the safety of anyone in jeopardy. Take the time to verify things have been done properly and the necessary inspections have been completed.

CAPT CARLTON FLIES WITH HMLA-269.

ORM corner

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Your Signal Is Divert ... Wait, What?

BY LT JAMES HALEY

The brief was nearly standard at this point of deployment. We were on month three of OEF, and the only difference today was that the weather might be a factor in-country. We were the event-one Hornet launch. When we arrived at the first point on the Boulevard, it was apparent the weather would be an issue. Isolated thunderstorms and multiple cloud decks meant navigable, but hazardous, flight conditions for the remainder of our transit and most of the mission.

After completing our mission, we checked out with the controller and received routing to get gas. The weather conditions were still going to present a challenge for our flight back to the boat. Our tanker was working an ad hoc refueling track at 26,000 feet because of the weather. As we approached for the tanker join, we brokeout into a soup-bowl of marginally clear air. The KC-135 was maintaining a constant wrapped-up circle to stay out of the surrounding clouds.

Our flight lead, aircraft 102, refueled first. Just before engaging the basket, the KC-135 — also known as the "Iron maiden" — hit a pocket of turbulence, the wings flexed, the plane shuddered and the basket jumped 10 feet.

I thought, "I hope we make it out of here with our probe."

Lead finished refueling and slid to starboard observation as I moved into position. Despite the fact that both the boom and basket were bouncing, we began to take fuel.

I said to my WSO, "As soon as we hit lead's fuel state, we're out of here."

I knew we'd have to hustle back to make the recovery. I thought that having an extra pass worth of fuel didn't outweigh the potential cost of ripping the probe off, so we eased out of the basket as we reached 15,200 pounds.

We entered the Boulevard southbound, and from the chatter and tanker weather-radar reports, we learned that the thick of the storms were in the 15,000-to-39,000-feet range. We established a lead-trail, nonstandard formation and pressed through the lighter cloud structure around 17,000 feet.

We initially calculated for a Case III ladder at 15 minutes after the recovery for a tank fuel state plus three on the ball. This is the CVW-3 standard (the Rhino tank state is a 2.5 Case I/II and 3.0 Case III, which we add three passes worth of fuel to, equaling a 4.0/5.7 ramp state). After hearing initial reports that the boat was working Case I conditions, we increased our speed slightly to not be as late. We reworked a fuel ladder and found we would have plenty of fuel for the 4.0 Case I requirement on the ball.

JUST AS OUR FLIGHT NEARED the last reporting point on the boulevard southbound, we heard the entire Case I stack get vectored to a holding radial, a clear indication of a change to Case III. After recalculating our fuel ladder, we would be tank plus two on the ball. We max-conserved on the descent and got vectored through the weather onto a 20-mile final at 1,200 feet, with aircraft 102 and the VFA-37 flight (aircraft 304 and 302) in front of us. As we steadied on final bearing, our flight lead told approach that they would be tank plus one on the ball with a 4.3 fuel state. We echoed their call (this was below the required fuel to divert, but within the acceptable blue-water tank fuel states).

Approach responded, “114, hook up. Your signal is divert. Break, break, 304, call the ball.”

On ICS, I said to my WSO, “Wait, what? Did you just hear that?”

He responded, “Yes, but let’s wait and clarify after 304 lands.”

304 proceeded to the in-close position, did not break out, and was waved-off by paddles.

Approach then came back, “304, 302, 102 and 114, hook up, your signal is divert.”

Instinctually, I turned toward our primary divert, the waypoint selected with a distance of 177 miles, and accelerated.

Approach then came back, “Your divert bears 219 for 200 miles.”

We changed the waypoint to our secondary divert, which matched the given bearing and distance more closely (being on final on the east side of the ship, we were another 20 miles farther than what approach had reported). We continued to accelerate while frantically pulling out the bingo charts. The heart of the thunderstorm appeared to be in the direction of our primary divert, and we thought approach knew something we didn’t. The 220-mile bingo with 80 knots of wind was a fuel of 4.9. I pulled up the winds page and saw the wind topping 60 knots directly in our face. We passed through 10,000 feet with our fuel at 3.9.

Aircraft 102 was five miles in front of us, also executing the bingo profile. The pilot told approach, “102 does not have the fuel to divert. We need a tanker.”

Approach replied, “Negative 102, your signal is divert.”

We knew there were two tankers about 20 miles south, but the longer we delayed and questioned approach, the less fuel we had. We continued the bingo profile, accelerating a second time from 10,000 feet, while FPAS (flight performance advisory system, which provides calculated range and endurance data based on current or optimum operating conditions) showed us on deck with 400 pounds.

We reached the cruise altitude for the bingo profile with a fuel state of 2.9. The winds at altitude were more than 80 knots directly in our face. We calculated fuel burn rates and time-to-go to see if we would make it. We also discussed ejecting and a quick game plan in that event.

After finally realizing the predicament, approach told aircraft 404, the airborne tanker with 18,000 pounds of fuel, to catch 102 and 114 for refueling. Unfortunately, he was 30 miles in trail. The tanker caught 102 as they were starting their descent. By then, however, we knew that we would make it and that trying to get in the basket on an idle descent from 41,000 feet would merely cost fuel. As we started our descent, approach was trying to understand why five FA-18s loaded with ordnance were headed its way.

My WSO and I discussed the landing. It looked like we’d have enough fuel to circle to another runway if someone in front of us blew a tire and fouled the active. Apart from that, we were landing, with or without clearance. We configured just inside of two miles and touched down with 800 pounds of fuel.

Transitioning between blue-water ops and divert ops is a dangerous business. Thunderstorms had closed in on the ship and were thick enough that aircraft did not break out at the in-close position. The decision was made to not attempt to land any more aircraft in those conditions; however, CVN air operations was looking at our fuel states that were 10-to-15-minutes old. They didn’t realize we were on final east of the ship, putting

us 20 miles farther from the divert. The decision to divert us was made on inaccurate information, and our updated “below bingo fuel states” were not correctly communicated to the leadership.

We should have been more adamant about needing a tanker when approach first called for us to divert. In retrospect, we should have explained to approach that we were not merely 1,000 pounds below the calculated bingo fuel, but that we would potentially flameout en route. This info might have triggered a different decision.

A better understanding of foul-weather tanking procedures, both on our part and the entire airwing, could have helped. “If weather overhead precludes normal tanker operations, the recovery tanker(s) will climb to 2,000 feet above the overcast layer. If VMC is not encountered, the recovery tankers will recommend a clear altitude and area (radial/DME) to Departure Control for tanking operations. If a tanking location is not available within 20 nm of the CV below 15,000 feet, blue water operations should not be attempted.” (COMCVW-3INST 3710.2J)

Finally, we should have been readier to divert. When there is a divert available, having those numbers set to go, not hesitating midway through the profile in the hopes of getting a tanker, and just flying a solid profile might be the difference between making it and not. We got above the weather cell en route, no aircraft blew a tire on the runway, and the divert weather was VFR. The situation progressed from a very comfortable blue-water, bad-weather day to an extremely uncomfortable divert scenario in minutes. All five aircraft made it to the divert, but it was a close call.

LT HALEY FLIES WITH VFA-32.

Another Engine

Why is a surface warfare officer submitting an article about EOCC to an aviation safety magazine? Because aviators, specifically helicopter pilots, should know that EOCC can have a drastic impact on the ship's speed through the water and its ability to maintain a green deck for landing and vertical replenishment.

BY CDR K.M. KENNEDY

Engineering operations casualty control (EOCC) are the measures that the engineering officer of the watch (EOOW) takes to respond to casualties [*malfunctions*] in the engineering plant. They are very similar to the Naval Air Training and Operating Procedures Standardization (NATOPS) emergency procedures. EOCC provides immediate, controlling, and supplemental actions in the case of engineering casualties to prevent further equipment damage.

EOCC is part of Surface Engineering Operating Procedures and covers every engineering system on the ship. Procedures differ from class to class and in some circumstances ship to ship. But they are all designed to either stabilize the casualty or stop the equipment to prevent further damage to the system. On gas-turbine ships, there are four major types of casualties that could impact flight operations: main engine, reduction gear/shafting, control reversible-pitch propeller and electrical. Implementing control measures for any of these categories with a helicopter on final could have a severe impact on the safety of the aircraft and aircrew.

Just as with an aircraft engine, a main-engine casualty aboard ship could occur for any number of reasons, from the loss of fuel flow to ingestion of foreign debris into the engine. Among the first steps in responding to any casualty is the EOOW taking control of the system from the remote station. In the case of an engineering casualty, the EOOW would take control from the pilot house.

With propulsion control now in the central control station (CCS), the actions taken depend on the type and severity of the casualty. Any engine casualty will require, if only temporarily, a change in the speed of the ship through the water. If at trail shaft — one shaft on one engine — the ship will be without any engines on line until another engine can be emergency started, which takes about 45 seconds. It is easy to see the danger to an aircraft over the deck or on approach if a ship suffers an engine casualty of any type, especially if operating at trail shaft.

Main-reduction gear, shafting and control reversible-pitch-propeller casualties have similar outcomes from the viewpoint of a helicopter on final. Main-reduction gear and shafting casualties are the surface equivalent to a "chip light" with secondary indications. Casualties resulting from situations like loss of lube oil pressure in a bearing or in the severest case of metal-on-metal noises from the main-reduction gear are all examples of shafting casualties.

Most surface ships, including all gas-turbine ships, do not have fixed propellers. They increase or decrease speed by changing the pitch of the propeller blades, and they reverse them to back the ship. Most common control reversible-pitch casualties are caused by the loss of hydraulic oil flow, which prevents the hydraulic lock to maintain or control oil to change pitch. In main-reduction, shafting and control reversible-pitch casualties, the EOOW will take control of propulsion in CCS and stop the ship. For a control reversible-pitch casualty, the EOOW will back the unaffected shaft to take all way off the ship — not something a pilot would want to happen while in a hover over the deck.

Electrical-plant casualties can either be on a gas turbine generator or the associated generator. A normal ship configuration is to have two generators on-line in a parallel configuration, so you have two generators feeding a single electrical loop. The third generator will be aligned for emergency start from CCS and can quickly be brought on-line if one generator trips off for any reason. If the one generator on-line cannot support shipboard electrical requirements, the system will "load shed" nonessential demands to ensure essential systems remain on-line, including propulsion and steering. There is little risk of completely losing the electrical plant, but it has happened. During a loss of the entire electrical load, there will be no communications and no lights, and the ship will be dead-in-the-water and not under command.

The only mitigation will be the landing safety enlisted (LSE) immediately waving off the landing until the electrical plant can be restored.

While we were deployed to the eastern Mediterranean, an MH-60R was on a day approach to recover and shut down after three bags of surface surveillance coordination (SSC). While on final approach and with the ship engine plant set to trail shaft, a casualty aboard the ship occurred, causing a loss of the shaft-control unit. When control was regained, the ship yawed to starboard before stabilizing on intended speed and returning to foxtrot corpen. Fortunately, the aircrew noticed a change in the maneuvering of the ship. Good communication aboard ship allowed timely information to be passed from the landing safety officer (LSO).

The helicopter waved off the approach and held until corrective action was taken in the engine room. The helicopter then landed. This could have been a different story if the casualty had occurred while the helicopter was over the flight deck preparing to land.

How do we mitigate this risk? As I prepared to take command on deployment with an air detachment, I spent a lot of time in my command pipeline considering steps to reduce the possibility of mishaps. At the Senior Officer Ship Material Repair Course (SOSMRC), we reviewed our prospective ship's restrictive-maneuvering doctrines. On *Gravely*, flight operations were not listed as a reason for implementation. Immediately after taking command, I implemented two changes to flight-quarters procedures: the setting of restricted maneuvering doctrine and the requirement to conduct flight operations in split plant — one engine on-line per shaft. Though an additional engine increases fuel burn and requires additional maintenance, it provides redundancy and reduces the risk of slowing even if there is a catastrophic casualty to one engine.

Restricted-maneuvering doctrine, however, is not a physical change to the engineering plant but a change to risk philosophy. This doctrine is set when the risk to injury of personnel, grounding, or collision outweigh the possible damage to engineering equipment, which could be caused by a casualty. Restricted-maneuvering doctrine changes the immediate and controlling actions taken by the EOOW in the case of an engineering casualty. Specifically, throttle control will be retained in the pilot house, the EOOW will take no actions that would take the last gas turbine engine or generator off-line, and all hands discontinue any preventive or correction maintenance on any propulsion, auxiliary, electrical, damage control or steering systems. This doctrine provides maximum safety to the aircraft and crew to ensure the ship maintains foxtrot corpen and speed while the helicopter is on final.

With the additional safety added and the possible catastrophic result of an engineering casualty, it should surprise you that restricted-maneuvering doctrine for flight operations has not been standard on my previous ships. The discussion of restricted-maneuvering doctrine versus standard engineering operations casualty control needs to be a portion of the initial discussion between the air detachment and the ship during Initial Ship Aviation Team Training (ISATT). Open discussion, training, and pre-planned responses to different shipboard casualties will increase flight-operations safety and result in better understanding between ship's watchstanders and flight-detachment personnel.

CDR K.M. KENNEDY IS THE COMMANDING OFFICER OF USS *GRAVELY* (DDG 107). LCDR JOHN NADDER WAS THE OFFICER IN CHARGE OF THE HSM-74, DET 1.

Mark, Mark

BY CAPT DAN BOWRING, USMC

The flight was a textbook, night escort with close-air support provided to a ground force and delivered by two MV-22 Ospreys. The weather was clear. The combined brief with the Osprey and skid crews went well. The instructors from both platforms had developed a solid, safe, and tactically relevant game plan for the pilots-under-instruction. I would be flying the UH-1Y Huey as Dash 2 to an AH-1W Super Cobra. The lead Cobra's student was receiving his last night-systems-instructor, pre-certification flight, and my copilot was receiving a series-conversion flight to complete her conversion from the legacy UH-1N to the upgraded UH-1Y.

UH-1N pilots transitioning to the UH-1Y have to complete a conversion syllabus prescribed by the UH-1Y Training and Readiness Manual. Flights from the Core, Core Plus, and Instructor syllabi must be flown based on qualifications and designations previously held in the UH-1N. My copilot was nearing the end of her conversion syllabus. Our goals for the flight were to continue to increase systems proficiency and use, and deliver effective rockets under low-light conditions.

The UH-1Y is generally easier to fly than the UH-1N; however, the systems interface and cockpit management differences associated with 1970's "steam gauges" compared to state-of-the-art technology and a glass cockpit present the biggest challenge for conversion pilots.

MV-22s via an IR laser pointer delivered from the FLIR. We joined-up on the MV-22s and provided fires on the zone to neutralize the notional threat.

Following the planned insert, the Ospreys departed for contingency holding, and we began providing close air support to the ground forces. With 13 of the 14 2.75-inch inert rockets remaining on our aircraft, I asked my copilot to set up for the transfer of controls. This would allow her to deliver the remaining rockets for her training. We executed a three-way change of controls, backed up with a shoulder tap as briefed, and she assumed control of the aircraft.

As planned, we set up to deliver rockets and guns on the airfield from a medium-altitude profile. A quick attack brief was given by the lead aircraft, and

As an instructor it is my job to identify potential missteps of students.

we rogered-up to a trail attack. As we were maneuvering to run-in for the attack, I heard a loud bang come from the cabin area. My reaction was to ask if the crew chief was working to clear a jam on the .50 caliber GAU-21 or if he had a round discharge while working on the gun.

The section's launch from MCAS New River to MCAS Cherry Point, where we would upload ordnance and fuel, was slightly delayed due to maintenance. However, there was plenty of extra time built-in to our timeline to deal with these sorts of delays, which are common during off-site ordnance operations.

Once on deck at MCAS Cherry Point, we discovered our second issue of the evening. The crew-served ammunition for our crew chief's guns to Cherry Point was still at MCAS New River. We got the ammunition to the Ospreys and delivered to MCAS Cherry Point's combat arms loading area (CALA). This second delay resulted in a shift of our intended timeline. After quick coordination over the radios while on deck at Cherry Point, the L-hour was slid right and the mission was back on track.

Entry in to the R5306A and BT-11 range complex was uneventful. The weather still was beautiful, and we had a no-moon, low-light night over the coastal marsh island. My copilot was focused on working the aircraft systems and using the FLIR to locate the landing zone, scan for enemy, and provide initial terminal guidance (ITG) for the

Before I could ask the question, our crew chief frantically relayed that our rocket pods had just fallen off the aircraft, with a couple of expletives added for emphasis. This was immediately followed by a "Mark, mark" call from our senior crew chief instructor. I marked our location as I began to digest what exactly had just occurred. My copilot immediately said she had accidentally hit the emergency jettison.

We quickly called terminate to our lead and notified range control of our jettison. Although we had an eight-digit grid, the pods were dropped from approximately 1,000 feet AGL and 100 knots. We had been in the middle of the range, and there was no chance the pods could have departed the range or hit any structures on the complex. The next 30 minutes was spent trying to recreate the expanding-box search pattern that I dimly remembered from flight school HTs. But, locating two green LAU-68 rocket pods in a dark swamp is nearly impossible.

At the conclusion of our range time, we returned to MCAS Cherry Point, and then to MCAS New River. Knowing that the jettison was a commanded jettison and there was nothing wrong with our aircraft, our commanding officer was comfortable with me bringing the aircraft home. The transit times back to Cherry Point and New River provided sufficient time to discuss the jettison and the conditions at the time of the event — specifically flight time in the last 30 days and total flight time in the UH-1Y aircraft. Although both of these numbers were low, they were average for a conversion pilot in our squadron.

As mentioned, the redesigned UH-1Y cockpit incorporates a hands-on collective and stick (HOCAS) set-up on the cyclic and collective. This allows the flying pilot to switch radios and MFD displays, select weapons systems, and perform a multitude of other functions without removing their hands from the cyclic or collective. The HOCAS switches are slightly different in design and feel to aid in identification; however, a pilot with limited flight time in the aircraft and even less flight time in the past 30 days can get mixed up. Specifically, the collective has eight switches with the radio transmit and emergency jettison next to each other. Although the jettison has a raised guard around the switch, a pilot could mash the jettison switch down while searching for the radio transmit switch.

As an instructor it is my job to identify potential missteps of students. At a minimum, I need to discuss and implement control measures that will help a less experienced pilot avoid a hazardous mistake. Simply discussing the placement of the emergency-jettison switch, feeling the switches around it, and moving your thumb left and right across the switches to identify vice mashing straight down could have helped prevent this jettison. Preflight blindfolded cockpit drills and systems discussions are tools that can be used and refined before ever strapping in to the cockpit.

A second set of conditions is harder to quantitatively evaluate: the intangibles of instructorship and CRM between instructor and student. After reviewing the flight, I believe there was a point where we had reached diminishing returns on my copilot's systems-learning objectives, and I should have shifted to her flying and familiarization with the low-light-level environment. I could tell she was struggling with the sensor and remaining oriented in the objective area. This is common when spending a significant amount of time heads-down in a new aircraft. As the instructor, I should have recognized the degradation in situational awareness and made a control change to help build her SA back up. Hindsight is 20/20, but perhaps if her SA had been higher prior to pushing in for an attack, the misidentification of the HOCAS switches would not have occurred.

An instructor is part mentor, part psychologist, part cheerleader, and part hammer as the situation dictates.

An instructor is part mentor, part psychologist, part cheerleader, and part hammer as the situation dictates. Identifying what role is necessary and how to instruct the multitude of different personalities in the fleet are the attributes of a good instructor. My evaluation of the overall situation and the real-time learning that was or was not occurring could have been an additional control measure.

Our jettison occurred in a restricted area, on a range, over a swamp. No one was injured, and no property was damaged, except the two rocket pods. However, this situation could have been catastrophic had it occurred over the numerous residential areas we fly over en route to the range complex. Our jettisons are armed from liftoff to landing, anytime we are carrying ordnance. Like everything in aviation, a simple mistake can result in a real disaster.

CAPT BOWRING FLIES WITH HMLA-269.

GUNS-A-BLAZIN'

BY LT ADAM KYLE

Nearing the conclusion of a COMPTUEX, my section of FA-18s was scheduled for a close air support (CAS) with Marines in the Pinecastle Range Complex. At this point in the workup cycle, we were comfortable with the range and flying around the ship. The weather was beautiful, and both pilots were looking forward to supporting the joint terminal attack controller (JTACs).

The mission began with a solid brief covering admin and tac admin. Training rules are briefed for every tactical flight, and for our CAS mission that day, air-to-surface training rules were covered, including contingencies for free-fall ordnance release and air-to-surface gun employment.

We launched from the ship under clear skies and proceeded into the range complex to work with the JTACs on the ground. The load out for each aircraft was 300 rounds of 20mm and two laser-guided training rounds (LGTRs). Following initial close air support (CAS) check-in, both pilots were given 9-lines and directed to employ LGTRs on separate targets. The 9-line process standardizes how ground troops communicate with air assets to designate and strike targets on the ground.

Visibility was fantastic for the first two runs, and everything seemed to be going exactly as briefed. Approaching the end of our cycle time, we requested strafe passes to expend our bullets. Again, we were each given a 9-line and talked onto a visually significant target on the range. I completed my air-to-surface checklist and descended to 6,000 feet AGL to set up for my first roll-in.

As I pulled the trigger, the gun spooled up and bullets began firing. At the bottom of the employment window, I released the trigger, but the gun continued to fire. I was surprised and confused. I had fired the gun dozens of times before and was shocked that something out of the ordinary was happening. I was in a 30-degree dive, pointed at the ground, and quickly running out of altitude before I had to recover the jet. I instinctively reduced my dive angle to 20 degrees and reached for the MASTER ARM switch. Before I could move the switch to SAFE, 300 bullets were expended; all bullets had hit on the range.

I recovered the jet, placed the MASTER ARM to SAFE and boxed SIM before heading back to the ship. This incident occurred within the span of about three seconds, and it highlighted for me just how quickly something unpredictable can happen.

The procedure for a runaway gun is covered by training rules that are briefed before every flight. The biggest learning point for me was just how quickly you need to follow the procedures, and how little time you have in a dive delivery to do it. In a runaway-gun scenario, releasing the trigger will be the first point at which you'll realize that something is wrong. Typically, at the end of our employment window, little time remains for aircrew to react.

Regarding air-to-surface gun employment, the standard operating procedure (SOP) states the following for a runaway gun: "The MASTER ARM shall be placed to SAFE and SIM shall be boxed. No further trigger squeezes shall be attempted."

Looking back, I asked myself what would have happened if I was carrying a full load of 578 rounds? If this had occurred at night, would I have reacted quickly enough to SAFE the MASTER ARM switch and recover? If this had occurred in combat, and not in training, friendly force position and collateral damage would be considerations. Just as aircrew look for airports to land in the event of an emergency, knowing the location of friendly personnel and where to safely point the gun could save a life.

A ready-room discussion of these situations will prevent aircrew from being as surprised as I was and prepare them to execute the procedures quickly.

LT KYLE FLIES WITH VFA-87.

This author's final point about ready-room discussions of unusual situations is a critical part of naval aviation's safety culture. Call it "hangar flying" or "chalk-talk," these discussions with other aviators are important to an aviator's professional development. Are we still practicing this enough? — CDR Albon "Bone" Head, Aircraft Operations Division Head.

HEAVY AND NO PLACE TO HYD

I was casually telling sea stories to my nugget pilots. I mentioned that in more than 1,600 hours in the E-6B, I'd never run an emergency-procedure (EP) checklist in flight.

BY LCDR TRAVIS SUGGS

On a gorgeous VFR winter day at NAS Patuxent River, and with 14 TACAMO souls on board, I pushed on all 96,000 pounds of thrust for a 10.5-hour communications mission. With two positive rates of climb, I tried to raise the gear, but they didn't come up. Knowing how common a sticky solenoid can be, I tried to get tough with the gear handle a few more times.

Suddenly the flight engineer called out, "Lost hydraulics!"

We climbed into the delta pattern to check things out. Both utility hydraulic pumps showed zero pressure. The hydraulic reservoir, and all 72 gallons of fluid in it, had gone to zero in a matter of seconds on the takeoff roll. This old Boeing 707 design has a great feature in that no hydraulics are required for aircraft control surfaces (it's all mechanical cables). After getting airborne and up to speed, we had a moment to catch our collective breaths.

After a few steps of the checklist, we intended to fly around for several hours to burn down to max landing weight. The jet still weighed over 300,000 pounds, so landing-distance data required us to burn down to 225,000 pounds or below to get on deck using the backup braking system. About 15 minutes later, we noticed the backup brake-pressure reservoir slowly dropping into the caution zone. Wondering if some system failure in the brakes had caused our hydraulic failure, we were concerned with how much time we had remaining with a reliable brake-pressure system. I declared an emergency and started dumping fuel. We coordinated with tower to switch to Washington Center and looked for a good spot to "reduce gross weight" out over the ocean.

We nervously tracked the rate of loss on the brake-reservoir gauge. We started an open discussion with Center and a few airline pilots, and confirmed the longest runways on the East Coast were JFK and Cape Canaveral — with 14,000-foot runways — just in case. The brake-pressure reservoir started to steady in the caution vice warning zone. NATOPS warnings stated that even with partial reservoir pressure, we would have sufficient braking action for a full stop on a dry runway such as NAS Patuxent.

We started to plan for the landing. I chose the longer runway at Pax River with a 13-knot crosswind

instead of a 2,000 foot shorter one with no crosswind. Returning to the delta pattern, all seemed well as we did a free-controllability check while dirty. But there was one last hydraulic gremlin left to tackle. Kicking off the autopilot, I noticed the jet required about 45 to 60 degrees of yoke to the right to keep the wings level. The problem was that one side of leading-edge flaps had partly retracted and the other side was still out full. We now had controllability issues.

I briefed that we would touch down, engage whatever spoilers we had, and use whatever braking action we could get from the brake reservoir. If we didn't feel good braking action, we'd take a waveoff and try something else: maybe dirty bingo to a 14,000-foot runway. We got set up for a four-mile, visual straight-in. The crosswinds felt more pronounced than expected because of lateral-control issues, but the awesome E-6 rudder is a powerful barn door on your tail that will keep you tracking down centerline if you provide the input.

At 50 feet, the jet wanted to float; we had no headwind (direct cross) and 15 extra knots for the leading-edge-flap asymmetry called for by NATOPS. Eager to get it down, I ensured a firm touchdown right after the LT bars at 2,000 feet past the threshold. The crew listening in on the ICS was relieved to have heard and felt "good brakes." With no nosewheel steering on the rollout, we had to counter the crosswind-weathervane effect with differential braking. We rolled to the end of runway 24, and the high fives commenced.

On postflight, we found hyd fluid splattered all over the underside of the right wing; further inspection revealed that an outboard spoiler had blown out during takeoff roll.

Never rush things if you are not in danger of going near the ground or ocean. Also, good checklist discipline works. Everybody stayed calm, and a little humor now and then helped. The day before, Pax River was 200 and 3/4 visibility in fog all day long; this emergency landing would have been no fun in bad weather. We had to decide shortly before landing to deal with a bit of a crosswind while fighting asymmetric flaps or take a 2,000 foot shorter landing distance. We thought that the riskiest thing would be to accept a shorter runway with a questionable braking system, but any danger with the crosswind on landing could be remedied with a go-around. I also think flying in landing configuration for a few minutes in delta was smart. It gave us a feel for the controllability issues before the crosswind landing.

The manufacturer's design of this old jet proved to be a real winner. Having the aircraft controls isolated from the hydraulic system helped ensure stopping distance was the big issue and not maintaining aircraft control. The Boeing 707 was considered a huge technological achievement of the "jet age" in the '50s, and it proved so on this day.

LCDR SUGGS FLIES WITH VQ-4.

Yep, It Is My Fault

BY LT BOBBY SMAIL

I was scheduled for an early evening E-2C flight. This syllabus event is the last one for student NFOs before they get winged. I talked with maintenance control before the brief and was told that our aircraft was ready. We also had a backup aircraft if needed. Neither of the aircraft discrepancy books (ADBs) indicated any major gripes. I then walked upstairs to finish the preflight paperwork. The weather forecast was great. I would be flying with a former T-45 instructor of mine, and all signs pointed to this being an easy flight.

The brief went well, and it was clear that the NFO students were prepared and eager to finish. After the brief, I checked the weather one more time, and went to maintenance to sign for the aircraft before grabbing my gear.

The ground-crew personnel were waiting for us at the plane. The plane captain said the aircraft was in good condition and ready to go. I shook his hand and did my preflight inspection. Once complete, I headed to the cockpit for engine start. After getting the engines started, the mission commander said the weapon system wasn't functioning. I called in a troubleshooter, but we quickly realized that we'd have to roll to the backup aircraft. I called maintenance control, and they started to coordinate for the backup aircraft. They told me to walk to the next plane, but advised there would be an unforeseen delay because of paperwork.

to delay for a paperwork mix-up. He again apologized for the delay but said the aircraft was fully mission capable.

After getting the backup aircraft on-line and completing the penalty turn, we started on the pre-taxi checks. We spread the wings, and I was given the signal by the plane captain (PC) to move the flaps to 30 degrees. I selected 30 degrees, but soon noticed that the flap indicator still showed 20 degrees (the required flap position for wing folding in the Hawkeye). I wasn't sure if we had a bad flap indicator in the cockpit or if the flaps had not shifted when I moved the flap handle. The PC said the flaps had not moved. Anyone who has flown Hawkeyes knows that stuck flaps are a common occurrence after a long mission; however, having stuck flaps on deck is rare, and I was on a tight timeline to get this plane in the air.

I selected 30 degrees, but soon noticed that the flap indicator still showed 20 degrees

As I exited the plane, I was greeted by the flight-line coordinator (who is supposed to have radio contact with maintenance control). He was unaware that we were switching aircraft. To complicate the matter, he did not know if we had a backup aircraft. He also didn't have the ADB with him. I still needed to sign for the plane. I became agitated. We now had only 20 minutes to get the backup aircraft started and airborne. Because the flight-line coordinator did not have the paperwork, I had to sprint 100 yards in my gear back to maintenance control; I felt they were unaware of my time constraints. They apologized for not having the paperwork ready.

I asked the maintenance chief, "What is the problem with the backup aircraft?"

He said it needed a "five-minute penalty turn" to get the port engine-oil servicing data correct.

Irritated, I told the chief that I had a 15-minute window to get this aircraft airborne, and now I had

I called in a troubleshooter. He asked me to recite the steps I had taken to move the flaps. I said that all I did was move the flap handle to 30, the flaps failed to move, and I returned the handle back to 20 degrees to match the actual flap position. After a few minutes of checking the hydraulic reservoirs and resetting some circuit breakers, the troubleshooter said that he did not know why the flaps stuck, and he needed to get a collateral duty inspector (CDI).

THE COPILOT AND I KNEW this wouldn't be a quick fix, and we'd probably be cancelled. We told maintenance control of the situation, and they sent a CDI our way. About three minutes later, the CDI arrived and asked about our troubleshooting steps so far. He then checked all the hydraulic lines and reservoirs that we had just checked. He also reset the same circuit breakers, and directed us to move the flap handle. We had the same result: stuck flaps.

I updated maintenance control. We had exceeded the timeline to get this flight completed and would have to cancel the mission. The command duty officer heard my conversation with maintenance and relayed it to Ops. I told Maintenance I would stay with the plane a little longer to assist troubleshooting; this was a bad decision. While I was doing all this coordination over the radio, we still had maintainers in the aircraft trying to resolve the stuck-flap issue.

Thirty minutes later, the CDI asked me to move the flaps by activating the emergency-electrical-flap system. Alarms immediately went off in my head. NATOPS clearly states that the emergency-electrical-flap system is not to be used unless it is required while landing, because you can override the load limiters and asymmetric protections in the flap system.

As all this was happening, I thought, "First, we were not airborne. Second, NATOPS doesn't mention this particular situation. Third, we were a mission-cancel already, and did I still need to assist in the troubleshooting?"

After telling the CDI my concerns, he mentioned the next step in the troubleshooting. The copilot and I discussed our concerns, and we were comfortable with performing the next step. It seemed logical. This was another bad decision.

After activating the emergency electrical-flap system, the flaps began to track. They appeared to track normally on the indicator in the cockpit. About a minute later, another maintainer entered the plane to inform us that we had crunched the starboard flap. I called maintenance and base to tell them what had happened. I shut down the aircraft.

On my postflight walk-around, there was a 6-inch shear in the flaps. It would require an entire flap change, and I knew we would lose that aircraft for a while.

After talking with the safety department and filling out my statement, including a phone call to the skipper, I went home for the evening. The next morning when I came into work, the skipper wanted to see me, as expected. I had been mentally preparing my defense for this conversation all night. He called me into his office to get more details on what had happened internally in the plane that had led to this flap crunch.

I went through the laundry list of details and events without hesitation. Like most closed-door conversations with a commanding officer, the main goal is to get in and get out as quickly and painlessly as you can. I was accomplishing this goal until he asked one very poignant question, "Did the maintainers or you have the NATOPS or maintenance pubs open in the plane when this troubleshooting took place?"

This question stopped me dead in my tracks.

I told him that I told the CDI what NATOPS says about using emergency electrical flaps, which was correct. But, I did not have the NATOPS open, and the maintainers did not have any pubs open during this process. With that information, he shook his head and said he did not have any further questions.

AFTER THE INVESTIGATION was complete, it was determined that this was not a Class C mishap. However, there was still damage done to an aircraft that could have been prevented.

In writing this article, I was thinking of all the little events that allowed for this flap crunch to take place. At the time, I was irritated with maintenance because I trusted what turned out to be an incorrect procedure. To solely blame maintenance for this flap crunch neglects to address one key axiom to naval aviation: Aircraft commanders are responsible for the plane and the people in it — period. We are supposed to analyze all details affecting the aircraft, its occupants, the mission, and make the appropriate decision. This concept applies not only to airborne operations, but ground operations as well.

Do I think maintenance was behind that day? Was the CDI very experienced? At the end of the day, I signed for that aircraft, and I made the decision to activate the emergency-flap system, no one else.

If you're currently flying around the world on deployment or stateside in a fleet or training command, take a moment before you walk to your aircraft, and think about what you're doing and the responsibility that comes with your qualification. Maybe this will help you QA your decisions a little better, so you don't find yourself explaining to your skipper why you made the decision you made.

LT SMAIL FLIES WITH VAW-120 .

Stick Stuck Hard Up

BY LCDR RODRIGO MIRANDA

It was a typical summer day in the Central Valley of California. The weather was VFR, and I was scheduled to lead a three plane low-level to R-2508 with two senior JOs.

Admin out to the area went smoothly. We entered the route by the Owens Dry Lakebed at 200 feet and 450 knots, strung out a mile in trail between each jet. The low-level portion of the flight went as published. We exited the route in the Panamint Valley and began an aggressive 45-degree climb to FL200. I directed my wingmen to begin their join-ups.

Upon reaching 15,000 feet, I tried to lower my nose to prevent slowing below 300 knots. I noticed the stick was not moving, even with added force. I immediately told my wingmen that I couldn't stop climbing. After several attempts, I finally broke my nose attitude at around 17,000 feet. The stick felt like it had been caught on something. We leveled off at 20,000 feet and continued the RTB.

I told Dash 2 to join in spread and told Dash 3 (the more senior of the two wingmen) to join in parade for a battle-damage check. Dash 2 suggested that I look for FOD in the cockpit. As I finished my FOD search, Dash 3 completed his external inspection and saw no visible damage to the aircraft. We slowed for level controllability checks on the eastern side of the Sierra Nevadas to determine whether we could return to NAS Lemoore or would be forced to take the aircraft to our briefed divert airfield, NAS China Lake. After slowing and configuring the aircraft, I decided to cross the mountains and bring the aircraft home.

After crossing the mountains into the Central Valley, we told base of our status and were told to descend to 12,000 feet as part of the standard course rules. I had planned a precautionary straight-in just to be safe. However, approaching 12,000 feet, I attempted to level-off but found the stick stuck in a nose-low position. I blew through 12,000 feet and informed Oakland Center that I was an emergency aircraft and was unable to hold altitude. Dash 3 took over some of the primary communication with ATC, while I concentrated on flying. I leveled-off at 11,000 feet and engaged autopilot to hold my altitude.

Switching-up base, we discussed configuring for landing and checked our controllability in a descent. It was obvious that the flight-controls were binding, which caused the aircraft to get stuck in a nose-high or nose-low position. A significant amount of force would be needed to break that nose attitude, but this could typically lead to overcorrections and pilot-induced oscillations (PIOs). My base and I decided to make a straight-in approach to an arrested landing with an LSO on station.

I DIRECTED DASH 2 to detach from the flight and proceed to the overhead and land ahead of us. Dash 3 would stay on my wing. Fortunately, NAS Lemoore had both runways operable, so the trap would not severely impact flight operations. Approach assigned us a block of airspace up to 11,000 feet overhead the field and began to coordinate with tower for our arrestment. My wingman and I dirtied-up; however, once I began a descent, the stick was again stuck in a nose-low position at about five-degrees down. This time the force required to level-off was greater than the previous occurrences. I told base that I couldn't stop descending. I aimed at an empty field and considered a controlled ejection if I couldn't level-off.

I broke the descent after losing about 2,000 feet of altitude. I was now oscillating between about four degrees nose high to four degrees nose low as the stick kept momentarily catching. I tried to engage the autopilot but it kept kicking off because my rate of descent or climb was too great for the system to engage. I finally leveled-off after about four iterations of PIO. When I caught my breath, base made an excellent suggestion of controlling my descent on final with only power and minimal touching of the stick; this proved to be the best way to control the aircraft. Base also suggested that I try to use trim to break some of the stick binding; however, that didn't work.

I finally turned inbound for the visual straight-in. Using base's suggestion of power as my primary altitude control seemed to be effective on final. Approach switched our flight to tower, and we checked in on a five-mile straight-in for an arrested landing to runway 32R. About two miles from the runway, my rate of descent was too much, and I added power. However, I continued to descend, and my airspeed began building. I pulled back on the stick to level off, and once again induced a small PIO. I stabilized about a half-mile from touchdown. I landed a bit short of the approach end gear but did engage the arresting gear. Flight over.

Our maintainers determined that a ball bearing on the base of the stick was faulty, causing the stick to bind and become stuck when it was a certain distance forward or aft of the neutral position. There were no faults with either flight-control computer or any control surface.

In hindsight, I should have done a more comprehensive controllability check than what was listed in the PCL. Because I had problems with climbs and descents, instead of simply configuring for landing and determining my approach speed straight and level, a climb and descent while dirty would have been prudent. This plan may have convinced me to land in China Lake, which was the closest divert, but I at least would have uncovered the binding controls at a higher altitude, thus giving me more time and options.

The communication with our base proved crucial, specifically the suggestion to use throttle position instead of stick position for altitude control. Had I diverted to China Lake, I might not have been able to establish good comms because of the line-of-sight complications caused by the Sierra Nevada Mountains between NAS Lemoore and NAS China Lake.

LCDR MIRANDA FLIES WITH VFA-97.

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STANDBY FOR FREESTREAM

BY LCDR JUSTIN ECKHOFF

The freestream recovery of a sonar dome is an emergency procedure (EP) commonly practiced in the MH-60R community. It is usually done in the simulator or without the dome actually in the water. That way you don't have to practice the emergency with a $2.8 million asset, hanging on a thin cable hundreds of feet below the aircraft. Our crew was flying in Lonewolf 710 and encountered this emergency.

Our squadron was onboard USS *Nimitz* (CVN 68), which was one month into its WestPac deployment. Lonewolf 710 had just gone through an A-phase maintenance inspection, and our maintainers had installed the airborne low frequency sonar (ALFS) sonar system. As the functional check pilot conducting the post-phase functional check flight (FCF), I wanted to make sure the ALFS would function should our squadron be tasked to conduct real-world, anti-submarine warfare (ASW).

The weather for the check flight was marginal, with scattered rain showers and patchy fog. However, we had the minimum visual-meteorological-conditions (VMC) of 1,000-foot ceilings and three miles of visibility to complete all our checks. We made our way through VMC as we cleared the carrier-control zone to find open airspace for the FCF. The ship drove on base-recovery course as she conducted fixed-wing flight operations.

Almost two hours into the flight, we had completed all required checks for the FCF and proceeded to op-check the ALFS. We had a newly installed dome, and the associated NATOPS procedure is to conduct an initial dip of 50 to 100 feet and then to fully seat the dome before conducting further dipping operations. We pulled into a hover at 70 feet and lowered the sonar dome to 90 feet water depth — a total of 160 feet of paid-out cable length (POCL). From the hover, we estimated the seas to be 5 to 7 feet.

After the initial op-check, we recovered the dome with no issues. We departed the hover and flew to the next dip location to conduct a full op-check at a greater depth. On the second dip, we lowered the transducer to 600 feet. We had another good op-check, so the crewman began to raise the dome with the reeling machine.

As the dome was about halfway up, we heard a loud squeal and smelled a strong metallic odor in the cabin. The reeling machine stopped with 307 feet of cable still deployed below the aircraft. Multiple error codes and cautions on the ALFS system were displayed. We were not even sure the transducer was

still attached to the cable. Cable angle hover — the automatic-flight-control-system function that keeps the transducer cable centered underneath the aircraft — was disabled when the malfunction occurred and would not reengage.

For the next 20 minutes, the pilot at the controls (PAC) had to manually control the aircraft to maintain position over the oscillating cable. The rest of the crew worked to troubleshoot the emergency. The crewman tried to raise the dome using alternate methods, including auxiliary electric and auxiliary hydraulic modes, but the cable would not reel in.

At this point, the carrier was more than 20 miles away. As the pilot not at controls (PNAC), I started working bingo fuel calculations and communications. Since we were at an altitude of 70 feet, the ship was out of line-of-sight communications range. The squadron CO was airborne in Lonewolf 711, so our crew opted to use his aircraft to relay communications to the carrier about our situation. After 20 minutes of troubleshooting, we determined that we had no method to reel in the remaining cable. As a crew, we decided to execute the freestream recovery EP.

The freestream procedure involves climbing vertically at 100-to-350 feet per minute until the sonar transducer clears the water. Our crew decided to climb to 500 feet, which would give us nearly 200 feet of dome clearance from the water and at least 100 feet of clearance over the carrier flight deck. We slow-climbed to altitude and had the crewman visually verify that the dome was still attached to the cable once it cleared the water. With the dome trailing this far below the aircraft, NATOPs limits kept us to a maximum of 70 knots and 15-degrees angle of bank for the return transit.

We slowly started back to the ship and requested a minimum wind over the flight deck. We also asked for mattresses strapped to the deck on an open area to cushion the landing of the dome. Weather on the return transit deteriorated with ceilings dropping to 500 to 600 feet. The prevailing visibility dropped to one mile with intermittent rain, with winds increasing to 35 knots.

Onboard USS *Nimitz*, it was the most inopportune time to attempt the emergency recovery. The ship had just cancelled the majority of the fixed-wing cycle due to the weather, yet there was still a C-2 turning on cat 3 prepping to launch. The ship agreed to provide minimum winds over the deck for the recovery and slowed to four knots. Departure cleared the airspace around the CVN to make way for our emergency aircraft. The squadron XO made his way to the tower to assist with communicating with us. Squadron maintainers scrambled to locate and position the mattresses in front of spot 9.

After a slow transit, we made final preparations for landing. Because of the poor weather conditions, we had to orbit for about 15 minutes as the CVN made its way through a squall, disappearing from view at less than a mile on final.

We reviewed the procedures for shearing the cable in the event that we encountered further problems over or near the deck. We also discussed waveoff procedures if we slipped into the clouds or lost sight of the ship. The crewman positioned himself in the open cabin door, so he could spot the dome. With 307 feet of POCL, he lacked sufficient depth perception to judge the height of the dome over the deck. He was able to provide adequate calls regarding the dome's lateral and longitudinal position below the aircraft.

The PAC, in the left seat, flew a slow approach up the stern to spot 9 at 500 feet on the baralt. He skirted the bottom of the cloud deck and kept clearance between the hung dome and the flight deck. At that altitude, only the bow of the carrier was visible. All control inputs were based on calls from the crewman and nonflying pilot who could see just the tower below him. The PNAC provided conning inputs to keep the aircraft clear of the tower and antennae, while the crewman conned the dome into position over the mattresses.

The two single mattresses were side by side and looked no bigger than a postage stamp from 400 feet above the deck. However, with timely and accurate conning by the crewman and PNAC, and control inputs by the PAC, we managed to hit the target. We lowered the dome directly onto the mattresses.

Once the dome was grounded, maintenance crews rushed in and pulled the cable to the starboard side of the deck. We slowly descended and landed forward of spot 9, between the 1- and 2-wire.

Post-incident analysis of the aircraft revealed that the sonar cable fell out of the guides on the reeling machine, and the cable became pinched between the reel and the housing. This caused the reeling machine to seize during flight. The excess tension during the seizure caused the cable to break, leaving the dome attached to the aircraft only because the cable was being pinched in place. As a crew, we were fortunate that the $2.8 million dome assembly didn't depart the aircraft. The dome was inspected and reinstalled in a matter of days.

TAKEAWAYS FROM THE EVENT

• Both the PAC and the PNAC were former MH-60R FRS instructors and had practiced manually controlling the aircraft with cable angle secured to keep the cable position centered. The task is not particularly difficult, but without sufficient experience, errant pilot inputs can induce excessive oscillations putting the dome and aircraft at risk. Just like learning to hover for the first time, it requires small inputs and patience to keep the dome stable.

• Cushioning the dome on a mattress or two sounds straightforward, but doing so from 400 feet requires solid conning commands from the nonflying crew and responsive inputs from the pilot. With a freestream conducted from higher altitudes, you might want to enlarge the area with more mattresses.

• CRM is not an abstract concept to which we simply give lip service. During the emergency and afterwards in the debrief, we commented how comfortable we were with the plan that evolved during the procedure, including bingo, wave-off criteria, communications and contingencies. Each member was clear on their tasks and we effectively backed-up each other throughout.

Our success started well before the flight by briefing clear expectations of crew responsibilities during emergencies, and then sticking to those expectations during the flight.

LCDR ECKHOFF FLIES WITH HSM-75.

"One piece of advice for those about to become nuggets: Don't relax because you finally made it to the fleet; the real test is about to begin!"

— LTJG Brandon Scott