THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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Approach

BIRDS IN RUNWAY ENVIRONMENT POSE DANGERS

The Navy & Marine Corps Aviation Safety Magazine
January-February 2009, Volume 54 No. 1

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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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Front cover: Birds roosting an approach lighting at MCAS, Iwakuni. BASH team efforts have resolved the problem. Photo by Ben Keasler, MCAS Iwakuni.
Back cover: Near-miss event (NME) between a C-130 and a gray heron at MCAS Iwakuni, Japan. Photo by Ben Keasler, MCAS Iwakuni.

Naval Safety Center Resources for Mishap Prevention

Naval Safety Center Aviation Safety Programs
http://www.safetycenter.navy.mil/aviation/index.asp

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Web Enabled Safety System (WESS)
http://www.safetycenter.navy.mil/wess/index.asp
help desk (757) 444-3520 Ext. 7048 (DSN 564)

Operational Risk Management (ORM)
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Aircraft Mishap Investigations
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Aviation Safety Surveys
http://safetycenter.navy.mil/aviation/surveys.htm
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Bird Animal Strike Hazard (BASH)
http://www.safetycenter.navy.mil/aviation/operations/bash/index.asp
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Aviation Data
http://www.safetycenter.navy.mil/aviation/aviationdata/index.asp
Customer support
(757) 444-3520 Ext. 7860 (DSN 564)

Statistics
http://www.safetycenter.navy.mil/statistics/index.asp

Additional Resources

School of Aviation Safety
https://www.netc.navy.mil/nascweb/sas/index.htm

Command Safety Assessments
https://www.safetyclimatesurveys.org
Dr. Bob Figlock, (888) 603-3170
surveys@advancedsurveydesign.com

Crew Resource Management (CRM)
Naval Aviation Schools Command
https://www.netc.navy.mil/nascweb/crm/crm.htm
(850) 452-2088/5567 (DSN 922)

Naval Aviation Safety Programs (OPNAVINST 3750.6R)
http://www.safetycenter.navy.mil/instructions/aviation/opnav3750


Photo by Allan Amen.

Naval Safety Center, NS Norfolk, VA

Human Factors Analysis Classification System

The DoD Human Factors Analysis Classification System (HFACS) is an investigative tool designed to classify not only the initial errors made in aviation, but also to identify the root causes and contributing factors to those errors. The causes may be found in maintenance, squadron leadership, or higher levels of overseeing agencies. DoD HFACS is intended for use by all persons who investigate, report and analyze mishaps and for members on mishap-investigation boards. HFACS presents a standardized method for identifying causal factors. This process allows for a more thorough and empirical analysis on single mishaps and trend analysis by type-model aircraft and by communities. More details about HFACS can be found at http://www.safetycenter.navy.mil/hfacs.

The naval aviation safety program will transition to HFACS in a multi-step process. Flight surgeons already are using HFACS in the aeromedical-analysis portion of mishap-safety-investigation reports, and it is taught at the School of Aviation Safety. Selected Naval Safety Center Class-A aviation-mishap endorsements now will include both the traditional "who, what, why" detailed causal factors, as well as HFACS, as an educational tool. When the HFACS portion of the Safety Center database development is complete, a change to OpNavInst 3750.6R will be transmitted for the fleet to discontinue using traditional detailed causal factors and to start using HFACS. Until that change is transmitted, there are no requirements to change existing reporting or endorsing procedures. An HFACS flip book that will guide you through the process is available by contacting the Safety Center and also is posted at:

http://www.safetycenter.navy.mil/aviation/aeromedical/downloads/human_factor_analysis_flip-book.pdf

For HFACS questions and transition recommendations, contact LCdr. Jeff Alton.
Jeffrey.alton@navy.mil, (757) 444-3520 Ext. 7231 (DSN 564)

Bravo Zulu

Squadrons that submitted five or more hazreps during 4th quarter, FY08:

VAW-120	VAW-121	VRC-40	VAQ-131
VR-56	HSL-49	HSL-51	VFA-103
VP-1	VP-8	VP-30	VP-45
VT-2	VT-3	VT-7	VT-10
VT-31	VT-35	VT-86	CMO-11

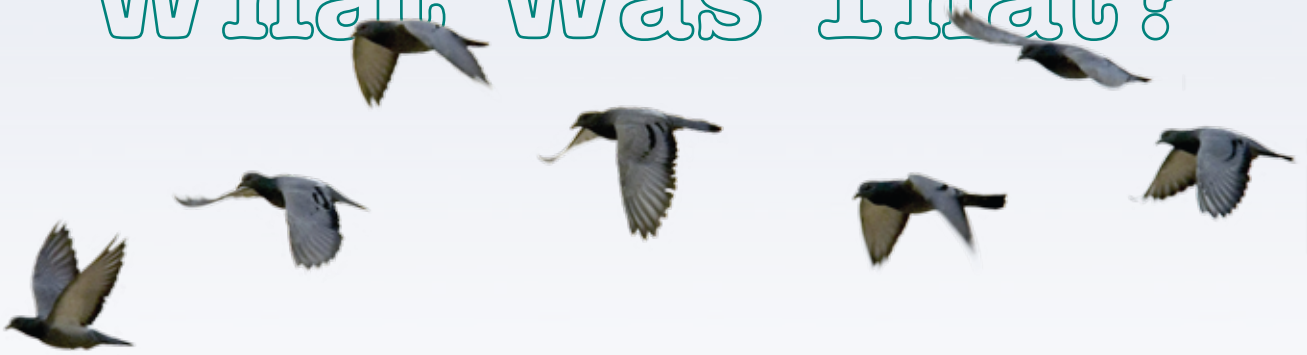
Other activities that submitted five or more hazreps are: MAG 41, 4th MAW Training Wing TWO, MCAS Cherry Point, Naval Base Ventura County, Point Mugu Naval Station, and Rota, Spain

Squadrons that submitted four hazreps:

VAQ-129	VAQ-134	VAQ-139	HSM-71	HSC-26
HSC-28	HSC-84	HT-18	VFA-32	VFA-106
VFA-143	VP-46	VT-6	VT-27	VT-28

USN Test Pilot School

SMACK, What Was That?



By Lt. Larry Tarver

Bird and animal strikes continue to be a hazard to all aviation activities. Probably the most important aspect of any BASH program is reporting. Information in these reports of bird and animal activity and actual strikes around airfields provide the most accurate and real-time information for pilot awareness. From the pilot on final approach, to the person driving the duty sweeper, to the contractor refueling parked aircraft, everyone should contact the tower and relay information regarding wildlife activities that pose a threat to aircrews and aircraft.

Reports of near-misses, aircraft strikes, and dead animals found in the area are important to maintaining an accurate database. This data increases our ability to address and solve wildlife issues. Information about species, location, and time of day can provide valuable data regarding problem areas in the airfield environment and on low-level routes. We then can identify what attracts the species to a particular area and in many cases, remove the attractant and modify low-level routes.

Our New Partner: The Smithsonian Bird Identification Lab

To assist reporting and hazard-mitigation efforts,

the Navy has partnered with the Smithsonian Bird Identification lab. Dr. Carla Dove and her team will identify remains, using samples of blood, feathers, skin, and snarge (bloody goo that results from a bird-plane collision) collected and sent to the lab. This information is used to update mishap and hazard reports (hazreps). Required forms and instructions for submitting remains can be found on the Naval Safety Center's website at: www.safetycenter.navy.mil/aviation/operations/bash/.

Activities submitting remains should enclose a PDF copy of the WESS BASH hazrep or mishap report with the submission. The report serial numbers will be used for tracking. Print the PDF copy of the WESS report after validation and before submitting the electronic report to the Naval Safety Center.

Costs Remain High

Birdstrikes cost military and commercial aviation more than $1.5 billion each year in aircraft loss, damage, and out-of-service delays. Navy and Marine Corps costs from 1980 to present are:

- 20 Alpha mishaps, costing $319,870,291
- 40 Bravo mishaps, costing $9,957,004
- 358 Charlie mishaps, costing $18,424,077
- More than 16,000 hazreps submitted (many with no cost entered), totaling $2,342,466

Total cost to the Navy: $350,593,838

This total cost is equivalent to:
4 FA-18E/F Super Hornets or
17 H-60 Seahawks or
12 P-3 Orions or
15 T-45 Goshawks

Underreporting Delays Fixes

These figures are based on what we estimate to be only about 25 percent of what should have been reported. Why is accurate reporting so critical to identifying hazard areas and mishap prevention? The "squeaky wheel" gets the grease, and if a problem is not reported, then awareness is not elevated, and nothing can or will be done to fix it. Report all BASH incidents as accurately as possible, and realize that BASH is primarily a safety and operational issue, not a natural-resource issue.

BASH programs are locally funded by the individual installations and governed primarily by local instructions. This creates vast differences in effectiveness because of minimal specific guidance and requirements. U.S. Fleet Forces (USFF) is seeking the development, funding and implementation of a Navy-wide, formal BASH program to increase effectiveness and decrease risk to pilots, aircrew, aircraft, and other Navy assets.

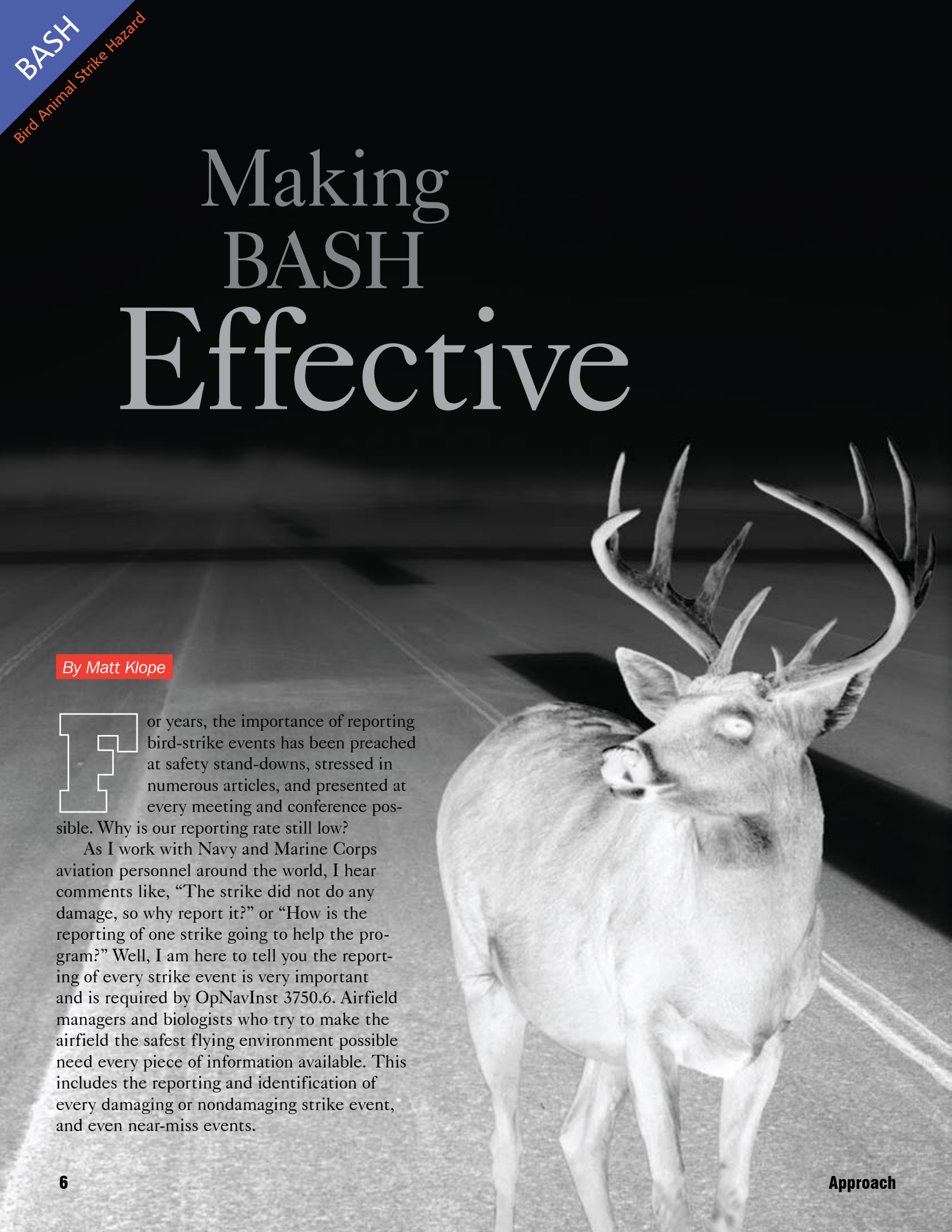
How to Check Local Bird Activity

For information regarding BASH conditions, go to the following website: http://www.usahas.com/. Use the search menus to get current conditions in your area, or for the route you will be flying. The website updates every six minutes and is as close as you can get to real time unless you have a local BASH radar system.

Lt. Tarver is with the Naval Safety Center.

BASH
Bird Animal Strike Hazard

Making BASH Effective



By Matt Klope

For years, the importance of reporting bird-strike events has been preached at safety stand-downs, stressed in numerous articles, and presented at every meeting and conference possible. Why is our reporting rate still low?

As I work with Navy and Marine Corps aviation personnel around the world, I hear comments like, "The strike did not do any damage, so why report it?" or "How is the reporting of one strike going to help the program?" Well, I am here to tell you the reporting of every strike event is very important and is required by OpNavInst 3750.6. Airfield managers and biologists who try to make the airfield the safest flying environment possible need every piece of information available. This includes the reporting and identification of every damaging or nondamaging strike event, and even near-miss events.

Wildlife populations and individual species are dynamic and unpredictable. Many species of wildlife (birds and mammals) inhabit or traverse airfields, and their patterns change throughout the year. Facilities with active BASH programs depend on wildlife-strike-and-survey data to prioritize funding and management strategies. If a facility can identify the problem species, they can direct deterrent or removal efforts and initiate habitat-management programs to make the airfield safer.

Just because all that was left was a smear on the leading edge of the wing doesn't mean you don't have to report. We have established a bird-strike-remains identification partnership with the Smithsonian Institution. The Navy and Marine Corps can now identify every bird strike, on every plane, at every facility. All you have to do is wipe off the smear or collect the feathered remains and fill out the Safety Center's Web-Enabled Safety System (WESS) BASH report and send both to the Smithsonian. A word of caution here: If we (Navy and Marine Corps) do not take advantage of this Smithsonian identification contract, we will lose it. Reporting information is available at: www.safetycenter.navy.mil/aviation/operations/bash/.

I also want to discuss a BASH-program dataset that is extremely important and definitely underused: the near-miss event. The airfield is a big area, and many of the birds are small. With development of the small, mobile, avian-radar systems, biologists can observe bird activity over large areas of the airfield, day and night. Biologists are documenting that near-miss events occur much more frequently than bird strikes. A combined dataset of bird strikes and near-miss events can provide BASH managers a more responsive metric to direct management strategies. They also can better measure the success of their program over time than by using only the bird-strike dataset.

Any near-miss event observed by a pilot or crew with a bird or any other wildlife, like a deer or coyote, should be reported. The time of day and location of the near-miss event is valuable information to BASH managers.

What is a "near-miss event"? It is anytime wildlife gets within a plane width of your aircraft. Or, you've had a near-miss when the pilot flinches and states, "What the *&%$# was that ^%$&#!!!!."

We currently are validating the digital avian radar technology through a project funded by the Department of Defense Environmental Security Technology Certification Program. To date, tens of thousands of hours of bird tracks have been recorded at several military airfields by these avian-radar units. In reviewing many of these tracks involving birds and aircraft, it's apparent the near-miss event is a valuable statistic to consider for airfield management and aircrew safety. Initial efforts show the number of near-miss events far exceed the actual bird-strike rate by possibly several hundred to one. We plan to refine this estimate by reviewing past radar-data files and files from this year. Combined, these two datasets may prove to be the most positive program statistic in many years.

For the airfield manager and the biologist to make the airfield environment as safe as possible, they need information. This information comes in the form of reported and identified wildlife-strike events and the reporting of near-miss events.

Mr. Klope is the Navy BASH coordinator.

If you have any questions or comments on the Navy's BASH program, contact:

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BASH
Bird Animal Strike Hazard

My Night Bird Strike

I was ready to key the radio to call for the downwind turn when we were shocked by the explosive sound of an impact to the aircraft.

By LCdr. Jason Garrett

We had launched from Mayport, Fla., for a routine proficiency flight. On takeoff, the city lights to the south and west of the airfield seemed fainter than on previous nights. We headed north along the coastline.

I was a new helicopter-aircraft commander (HAC), with barely 25 hours under my belt in that role. The helicopter second pilot (H2P) was new to the squadron, and this was our first flight together. I finished the after-takeoff checklist from the left seat, as we continued north. We turned east over the pitch-black sea, intent on rebasing our night Dopplers and conducting SAR training near some of the lighted buoys. The winds were light and favored the east, so we set up for our Doppler approaches to 80 feet. We quickly appreciated just how dark it was as we stared into the blackness and rode the aircraft into an 80-foot hover.

After working in the area for about an hour, we departed from our last Doppler hover and climbed toward 500 feet. It felt much better to be climbing away from the water and turning back toward the dimly lit horizon to the west. We reached Mayport and flew a pattern entry to sharpen our nighttime skills in the landing environment. I flew the first approach to the numbers. After a quick stop-and-go, I accelerated to 80 knots and climbed over the runway, finally leveling off at 500 feet.

I was ready to key the radio to call for the downwind turn when we were shocked by the explosive sound of an impact to the aircraft. Wind roared through the cockpit, and I felt something hit my left hand as I gripped the collective. We had hit something, and I could see white streaks down the left side of the air-

craft, starting just above the chin bubble in front of me.

Instinctively, I lowered my chin to cover my throat and protect my eyes in case anything else hit the aircraft. I scanned the engine instruments to make sure the aircraft still was flying, and the engines were not FODed out. I then looked back at my flight instruments to make sure we were straight and level at 500 feet. Everything seemed to be operating well. After a moment of silence, I was interrupted by the roaring sound of wind and a few swirling papers from my kneeboard. I banked the aircraft to enter downwind and called tower to let them know we'd just had a bird strike, and we were turning downwind for a full stop.

The aircraft flew and handled well as I made the turn. Once established in the turn, I again scanned the instruments. I called for a swap of flight controls to the H2P. Something had hit my left arm, and it was time to see what it was. I looked over to the side and saw a large triangular hole in the window. The ventilation scupper had been torn out, along with a large piece of the window. White streaks marked the window where a bird had slid along the glass and disrupted the fine layer of salt encrusted along the aircraft from our previous Doppler approaches. I looked at my hand and then the floor and found a large shard of broken Plexiglas. It was clam-shelled around the edge and sharp as a razor on all sides. I then looked at my wrist where it initially had fallen and noticed a clean, straight cut.

The H2P flew the precautionary-emergency landing as I finished up the checklists and talked to tower. We taxied into the line with no further incidents. Tower sent a safety truck to the departure end of the runway to look for the bird and the scupper that had been torn off the aircraft. They searched for awhile but found neither. Maintenance did a FOD check on the aircraft, and besides a few feathers inside the cockpit, they did not find anything else wrong with the aircraft.

While bird strikes are not uncommon to naval aircraft, I never had heard of one happening at night. Apparently, birds do indeed fly after the sun goes down, and they can be flying in the traffic pattern with you.

By complete chance, I had my clear visor down to protect my eyes. To be honest, I had made a habit of pulling my clear visor up when the sun goes down because it shows so much reflection from the console lights, not to mention all the scratches and chips I have to look through. The one thing I had failed to do was to put my gloves back on after my Doppler approaches. I had taken them off while over water and did not remember to put them back on. If I had worn them, I would not have received the cut on my wrist that night. While it was only a scratch, it could have been much worse, and my gloves could have offered me needed protection.

Finally, I learned that the Plexiglas in some of our aircraft windows of is not shatterproof, and if it breaks, it can be quite sharp. I do not know if the actual glass windscreen in front of me was shatterproof or not, but I do know I don't want to learn the answer by way of another bird strike. To this day, I leave nothing to risk: I fly with my gloves on and my visor down, day or night.

LCdr. Garrett flies with HSL-37.

Information on reporting and submitting bird remains to the Smithsonian Bird Identification Lab and incident reporting procedures can be found in Lt. Tarver's article in this issue, "United States Navy Bird Aircraft Strike Hazard Program (BASH)," p. XX—Ed.

BASH
Bird Animal Strike Hazard

Turkey Buzzards *and* AOA Management

By Lt. Benjamin Libby

I had been in the squadron for one month and had flown 17 flights since leaving the FRS. Our E-2C squadron was preparing to go to the boat for tailored-ships-training availability (TSTA), and I was to begin field-carrier-landing practice (FCLP).

We launched from NS Norfolk and headed to NALF Fentress, enjoying clear skies and nice weather en route. The prevailing southwest winds focused our attention on the landing pattern for runway 23. The pattern for runway 23 is unique for noise abatement and is not the normal 600-foot carrier pattern.

After pattern entry, our first lap around the pattern was uneventful. We spotted several birds at various points throughout the pattern. A couple more passes confirmed that birds would be our most difficult issue with regard to pattern management. On the fifth pass, at the 135-degree position, I noticed several birds directly in our flight path at the 90-degree position. As I continued my pattern, trusting the birds would move, I realized my flight path and a single turkey buzzard were about to occupy the same space. The bird was headed straight for the port propeller. I pressed ahead, again trusting it would dive out of the way as I approached. The bird had no plans to move out of the way; we were on a collision course. I maneuvered the aircraft and added power to avoid the buzzard. It remained in my original path of travel, passing slightly below the port wing but not into the port engine.

So, I saved the day, right? Wrong. With the large power addition and the rapid roll to wings level, I did not program enough nose-down input with the control column. The nose of the aircraft pitched up. The on-speed condition I was in turned into a slow condition with a subsequent AOA spike and rudder shakers at 400 feet AGL. I immediately added a significant amount of nose-down control input and called, "I got it," over the ICS.

The rudder shakers stopped. The AOA settled down then went fast, and altitude remained constant. We resumed our turn toward the runway with the aircraft high and fast. My copilot, the aircraft commander, told paddles we would "take this one around high for birds."

What should I have done? What are the possible outcomes of the scenario? If the aircraft indeed had stalled at low altitude, would there have been time, altitude or energy available to recover? If we had struck the bird, what would have been the damage? Would the engine have seized? Would the bird have damaged the leading edge or control-surfaces? All of these questions and more can be debated at great length.

Before every flight, we plan for weather and address safety concerns and ORM. Bird strikes have to be consciously included in this planning. We must be aware of the BASH condition and be prepared to react to it in flight. Don't say, "I would have done this… " Ask yourself, "How will I deal with a similar situation in the future?"

Lt. Libby flies with VAW-121.

The Aircraft Can Pose Hazards

By Lt. Jake Dunne

Earlier last summer, a situation challenged our squadron, and thanks to coordination and communication between the aircrew and maintenance, a catastrophic situation was avoided.

While combating the lazy days of summer in Norfolk between a rigorous work-up schedule, our squadron enjoyed some downtime as we flew daily missions to maintain aircrew currency. The monotony of these types of missions is enough to make anyone complacent.

On a hot and humid day in early June, aircraft 603 took off from Norfolk to enjoy a day of flying in beautiful weather. The route of flight was common for most East Coast Hawkeye squadrons, the "Hummer track," a 50-mile leg of airspace that runs parallel to the coast between NAS Oceana and Elizabeth City.

With the copilot in the right seat, the first hour of the flight was uneventful. Soon though, both pilots noticed the oxygen-quantity indicator for the LOX (liquid oxygen) system was decreasing rapidly from a full 10 liters. Suddenly, the flight had become eventful. As the oxygen gauge slipped past one liter, the associated oxygen-caution light came on, and the aircrew immediately pulled out their PCLs (pocket checklists) to follow the next steps of the emergency procedure. After following the first step of the EP and descending below 10,000 feet, the crew decided it was time to go home.

After landing, we reported the issue to the maintenance crew who immediately investigated. AME2 Robert Henderson went into the cockpit to check for the usual suspect in most caution or warning lights: a loose wire. After confirming a loose wire was not the culprit, the AME2 then hooked up LOX to the aircraft's oxygen system, trying to refill it. Strangely though, the oxygen gauge didn't move. His next troubleshooting step was to follow the oxygen tube through the fuselage to check for a possible leak in the system. Following the oxygen line with his hands, he discovered a chafed LOX tube and a wire bundle behind one of the many avionics boxes the E-2C houses. The wire bundle had chafed so much that it had begun to arc, as evidenced by the charring around the exposed wiring.

Suddenly, he realized this problem was more serious than just loose wiring. It doesn't take a LOX specialist to realize the idea of exposed compressed oxygen, combined with a spark from an arcing wire bundle, could have been catastrophic. After telling his chief, word soon got around about the crisis that had been averted. Maintenance crews immediately checked the other three aircraft for similar problems, but they didn't find any.

The aircrew, who had gone home for the day, did not realize until the next day how serious the situation was. "Suddenly it sunk in that we easily could have exploded in midair," said one of the aircrew.

Our hazrep investigation revealed a few things that probably had saved the lives of the aircrew. As part of the back-end system checks that day, the cooperative-engagement-capability (CEC) system had been turned on; this system had the box with the charred wire bundle. When the system didn't work, presumably because of the exposed wire, the system was shut down. This action stopped the electrical current and most likely ended the possibility of an explosion. The hazrep also revealed that AME2 Henderson's troubleshooting actions were essential to the discovery of this hazard. After releasing this hazrep to the Hawkeye community, one other squadron encountered chafed wiring in the same location.

Photos by Ltjg. Kallie Rose, VAW-126.

Every month our quality-assurance (QA) division nominates a Sailor as a "Safety Pro." This recognition goes to a Sailor who went beyond his or her normal duty and increased safety of our squadron. The August 2007 nominee was AME2 Henderson.

Lt. Dunne flies with VAW-126.

The November-December 2008 issue of Approach *had a feature article by Cdr. Bert Ortiz, "The Maintenance Department and You, the Aviator," which highlighted the maintainer's role in aviation safety. Petty Officer Henderson exemplifies this role, and the squadron's use of the hazrep program is a good "best practice" example.—Ed.*

BEST PRACTICES

Prepare

By Lt. Joe Doman

The flight was over. We had located a Colombian fishing vessel of interest and had maintained visual and forward-looking-infrared-radar (FLIR) coverage on it until our ship had closed our position. We were back on deck, and I was three minutes into the standard six minute "burnout" following the engine water wash. The Coast Guard airborne use-of-force (AUF) gunner and in-flight observer rushed toward the aircraft from the hangar. After unsuccessfully trying to signal to the plane captain to restrict their entry into the rotor arc, I quickly decided to expedite shutting down the engines without using the checklist.

for Glory

The bridge then spotted a go-fast, and a flurry of activity followed. Our entire crew and maintenance team was excited to get our first go-fast. Our Red Stinger 102 was off the deck within 30 minutes. It was a textbook alert launch, as we carefully but hurriedly completed the checklist and launch sequence. Our turbine-gas temperature (TGT) was high on launch but within limits.

Immediately after making our "ops normal" call, we spotted the fleeing vessel with its prominent and unmistakable wake. Within three minutes, we were in position for the reconnaissance phase. Our checklists were a blur, but complete, I thought. As we approached the go-fast from the stern, we had visual and FLIR confirmation they were throwing bales of cocaine overboard. The activity within the aircraft and the comms with the USCG law-enforcement-detachment (LEDET) officer on the ship were controlled chaos. We quickly received permission to engage the drug smuggler with warning shos and disabling fire.

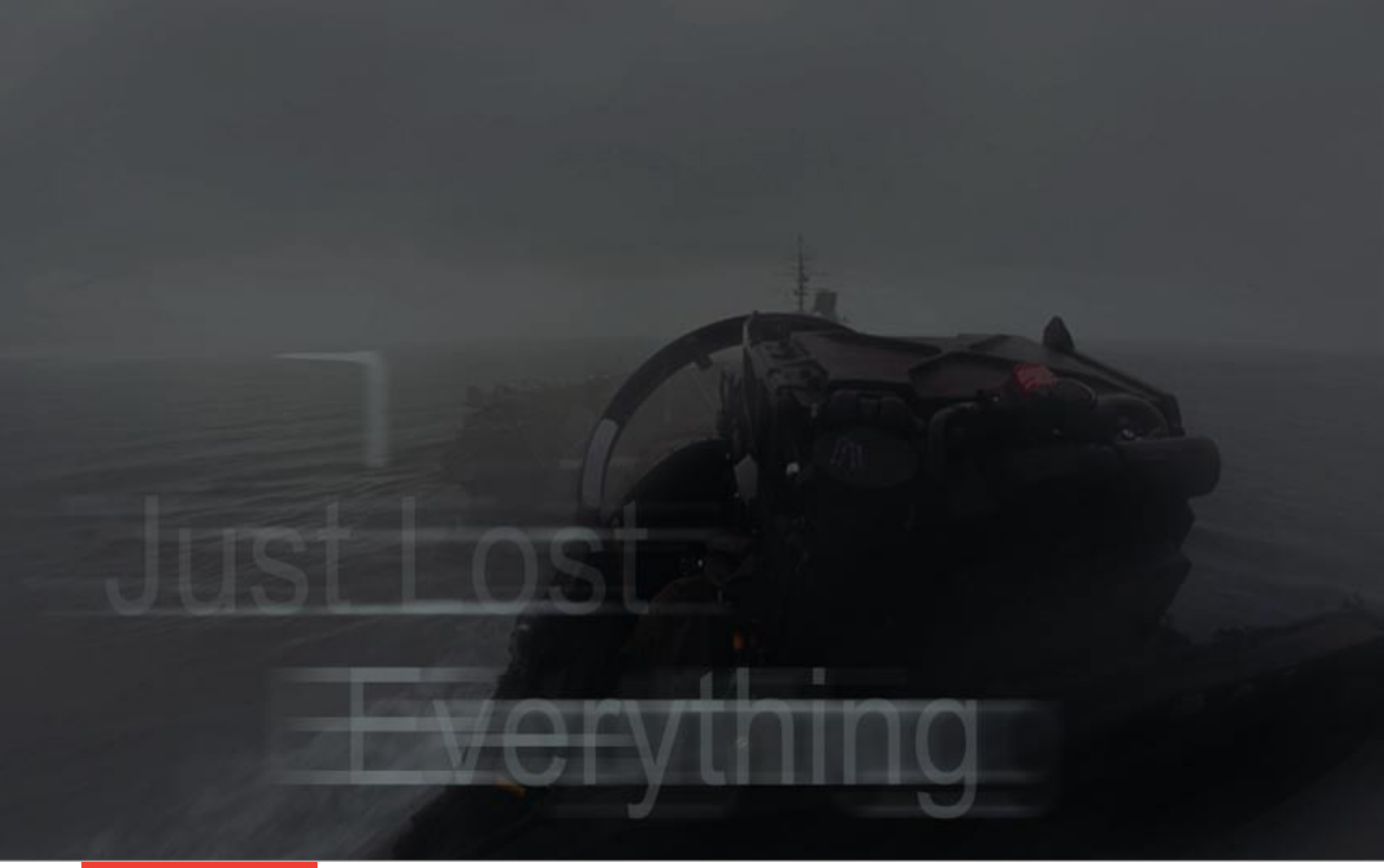
We signaled the go-fast over bridge-to-bridge radio in Spanish to halt their vessel—to no avail. We quickly moved into position for warning shots. Three "stitches" of 7.62-mm-caliber fire were placed just before the bow of the evasive small craft. The drug runners persisted in their high-speed but futile getaway. We slid aft into position for disabling fire, and our USCG sniper's aim was true. Three shots pierced the boat's engines, and a plume of smoke arose as it went dead in the water.

As we circled the vessel while the ship approached, we couldn't sustain a high hover without excursions into the limited range of TGT. We discussed being heavy (because of the extra crew members and gear) and decided to keep airspeed on the aircraft to avoid extended periods of time in the limited range for TGT.

We landed on the deck as heroes, or as close to that honor as LAMPS pilots can get. My reward? I got to finish off that engine water wash. Going through the checklist, I got to the fourth step, "Engine anti-ice —ON." It already was on. Any SH-60 pilot can guess, the NATOPS warning that flashed in my mind, "With anti-ice on, up to 18-percent torque available is lost… ." I just had flown the entire mission with degraded-engine performance because somewhere we had missed a step in the checklist pre- or post-takeoff. This dose of reality hit me in the face like a ton of bricks. I recall the statistics from the Naval Safety Center that say 80 to 90 percent of naval mishaps are caused by human error. This event was very close to being one of them.

We were inconvenienced by the degraded-engine performance, but the oversight of a single checklist item could have proven catastrophic. Actual mission tasking often comes with circumstances and departures from those experienced in the training environment. It is vital to observe the basics. Checklists never can be less than thorough.

Lt. Doman flies with HSL-49.



Just Lost Everything

By LCdr. Ken Rogers

I was ready for my last Operation Enduring Freedom (OEF) sortie before we out-chopped from 5th Fleet. Filling in for my XO, who felt under the weather, I jumped into a good-deal, day mission into southern Afghanistan, with a night landing back in the Gulf of Oman. As a great ending to OEF, I would support a ground element with a GBU-38 and 200 rounds of 20mm.

We already were 30 minutes late for our final tanker time, and with 500 miles to transit back to the ship, we only had 45 minutes to do it. After tanking, as I waited for my wingman to finish, I noticed a slight rumble, followed by a small fluctuation in my fuel flow on the right engine. However, the indication vanished as quickly as it appeared. After my wingman finished tanking, we jumped on the boulevard southbound and set Mach .89. I thought we only would be a few minutes late for our recovery time.

Not so fast. About 200 miles from mom, I felt a second rumble, quickly followed by a right AMAD (airframe-mounted-accessory drive) caution on the DDI (digital-display indictors). I broke out the book. Because it would take more than five minutes to reach mom, I had to shut down the right engine and restart for landing. Chock full of gas because we had refueled late, I couldn't hold 24,500 feet, single-engine. I squaked 7700 and did what I could to hold above 17,000 feet in Pakistani-controlled airspace.

It didn't take long for the Pakistanis to come up on the boulevard common frequency and query, "Aircraft squawking emergency 50 miles south of Panshir, say intentions."

If you've ever had a discussion with Pakistani ATC, you know why I wanted to hook up with our folks. Plus, the Hawkeye bubbas were airborne on the boulevard, and they're better at talking on the radios than I am. I asked the E-2 crew to kindly take care of the airspace below me and tell the Pakistanis the nature of my emergency. After 10 more minutes of transit time southbound on the boulevard, I finally found myself feet wet and within radio range of mom.

I quickly checked in with my squadron rep and told him I had a right AMAD caution, I had shut down the engine and intended to restart for landing. He broke out the book and concurred. With no moon and with the weather at 1,000-to-1,200 feet overcast at the ship, we elected to do a long straight-in. We'd restart the engine at 25 to 30 miles out, while staying above the clouds

to have everything suitcased and dirty by 10 miles. We secured the right generator on restart to reduce the heat and load on the AMAD as NATOPS directs. Everything appeared to be working according to plan.

I tried to adjust gross weight at 10 miles, but the switch wouldn't stay in the dump position. No, you can't hold the switch forward and make it dump—I tried. I told the rep and CATCC I couldn't dump, and I would have to discontinue the approach to burn down the gas. CATCC instructed me to take Angels two and proceed straight ahead. After a discussion with the rep, we decided to stay dirty, to again shut off the right engine, and to restart for the second landing attempt. I took a long hook at 14 miles and got set up on the second approach. After a quick restart on the right engine at 10 miles, I was set up to land at max trap of 34,000 pounds. That's when the wheels came off.

As I descended below the cloud layer, and approached the ball call at 600 feet, I felt a surge in the right engine. The surge was followed by a large flash from all the displays, then by total darkness in the cockpit. When I say total darkness, I mean no HUD, zero DDIs, and zero cockpit lighting. My thoughts centered on expletives, lots of expletives.

"Rep, 306"

"Go ahead, 306"

"I just lost everything."

"What do you mean you lost everything?"

"I mean I have no instruments, no HUD, no DDIs, no cockpit lighting, nothing."

I immediately took my waveoff from the approach and entered the cloud layer at 1,000 feet, in what I estimated was a gentle climb. I took out my "photon" light that was attached to my flight gear and illuminated the standby gyro—I was slightly nose high. In the Hornet, if the situation comes down to relying on your standby instruments for any piece of information, things definitely have hit the fan. When the rep replied to my radio transmission, it was apparent I had not lost everything—just everything I cared about.

My rep tried to bring order to the madness and asked me to look at my IFEI to see if the engines were running. I took out my photon light again and illuminated the panel and, indeed, both engines seemed to be running, which was good. I quickly broke out above the overcast layer and had a decent horizon, with starlight shining off the top of the layer as an attitude reference.

My main concern was not killing myself by flying the jet into the water, so my left hand had both throttles at mil, in what I perceived as a slight climbing attitude. No way was I going to land on the ship. I probably could manage to bolter or put it into the jet shop if requested, but they were about my only options.

Suddenly, I saw another large flash in the cockpit, and my left DDI and HSI came back to life. The left DDI was stacked, with about as many cautions as you get on startup, but at least it was a step in the right direction. I quickly brought up the HUD repeater on my left DDI and the HSI. To my surprise, I had a velocity vector in the HUD repeater but no numbers for airspeed or altitude in the boxes. All cockpit lighting still was inoperative, and the HSI had no TACAN or any other navigation info. Cautions on the DDI included: R AMAD, R GEN, MC2, CNI, VOICE / AUR, FCS, R PITOT HT, R DUCT DR, GLIM 7.5 and a FCES light on the lower caution panel.

The rep said the recovery tanker was en route to join on me and to drag me back to mom for an approach. The tanker found me at 4,500 feet, five miles ahead of the ship, and significantly to the right side of the extended final bearing. The tanker pilot read airspeed and altitude as he dragged me in a wide right turn to final bearing and descended to 1,200 feet.

To my surprise, I picked up the ILS at 10 miles, and the tanker began the approach below the overcast layer. Fuel was now an issue, but I had enough for one pass. I kissed off the tanker and called the ball with 2.8 on the gas. Paddles lip-locked me into a 4-wire. I taxied out of the landing area, where I quickly shut down the right engine and hooked up to a tractor.

Postflight analysis showed significant heat damage to the right AMAD, including burnt insulation to the wire assembly. The decouple-handle assembly and power-transmission shaft (PTS) input shaft were burnt and melted. Everything smelled bad as well. After looking at the big book, we determined that after the prolonged right AMAD failure, the heat buildup had burned wires and induced a right generator-inoperative-with-bus-tie-open condition, coupled with failures on the air-data computer (ADC), signal-data computer (SDC) and stores-management set (SMS). A popped circuit breaker for fuel dumping also prolonged the duration of flight with a bad AMAD.

When you get the chance, look at what you will be missing on some of the "Emergency Power Distribution" scenarios in NATOPS. None of the options are very good, but it should give you enough resources to get on deck, with a little help from your friends.

LCdr. Rogers flies with VFA-151.

Manage Risk to Ensure Mission Success On and Off Duty.

20

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Pitchlocked in Paradise

By LCdr. John Buser

We were enjoying another beautiful, late-afternoon flight out of Marine Corps Base Hawaii, Kaneohe Bay. After the high-altitude intelligence, surveillance, and reconnaissance (ISR) portion of the mission, we were about 30 miles from home base. I was flying from the right seat because our patrol-plane pilot (2P) had flown the first couple of hours from the left seat.

I initiated a flight-idle descent from 16,000 feet to get below a broken layer at about 4,000 feet, for the low-altitude portion requirements. As we passed 10,000 feet and 280 knots, our senior flight engineer (FE) called out from behind the FE seat, "Prop pump 1 on No. 4."

In the same breath, he called out, "Prop pump 2 on No. 4, overspeed No. 4."

My first thought was one of disbelief. Surely, this major propeller malfunction was not happening to me. After a few seconds, the disbelief subsided, and the training kicked in: Aviate, navigate, and communicate were my first coherent thoughts. With these priorities in mind, my first actions were to level the aircraft, maintain VMC, and slow to a more manageable airspeed, where events would occur at a slower pace than 280 knots.

Once I was confident the aircraft was in a safe position, flying- and location-wise, I started to deal with the prop malfunction. Training and chair flying paid off huge. I had chair-flied this malfunction many times and always had told myself, "If you do nothing else, advance the affected power lever."

The P-3 NATOPS propeller-malfunction procedures can be cumbersome, and this simple thought allowed me to take quick and correct action almost instinctively. I scanned the No. 4 engine instruments and noticed clear indications of a pitchlocked propeller. In this case, the cause was an instantaneous loss of controlling propeller fluid, creating what was essentially a fixed pitched propeller. This situation is relatively good.

Only one question remained: At what blade angle did the prop pitchlock? Pitchlocks at high blade angles tend to yield better controllability, whereas pictchlocks at low blade angles can lead to serious controllability concerns when it comes time to land. I hoped for the former.

As we ran through the rest of the NATOPS procedures for "operation with a pitchlocked propeller," it quickly became evident we were fortunate. Engine indications of a very high shaft-horsepower reading for the airspeed we were flying indicated the prop indeed had pitchlocked at a relatively high blade angle. Little did I know this good situation would present its own challenges later, as we prepared to fuel chop the affected engine.

Nearing Kaneohe Bay, we still had much work to do before landing. Again, falling back on chair flying, we elected to divide the flight-station duties to maximize CRM and situational awareness (SA). The 2P was flying from the left seat, the 3P was reading NATOPS from the radar cabinet, the senior FE was in the FE seat maintaining 100-percent rpm on the No. 4 engine, and I monitored the situation from the right seat. After the 3P finished reading the NATOPS procedures, we completed the checklists.

I took the controls after the seat swap. I planned to keep the aircraft in a clean configuration, slow down to 180 knots (well above our 1.52 Vs speed, yet slow enough to help limit the chance of the propeller decoupling from the engine upon fuel chop), and fuel chop the No. 4 engine. At 185 knots, and just before entering the delta pattern downwind, we noted the following indications: almost 4,000 shp and 100 percent rpm on the No. 4 engine, 185 knots IAS, and the 1, 2, and 3 power levers all at flight idle.

I had not thought about this situation when hangar flying this malfunction. The 4,000 shp on the No. 4 motor was more than enough to maintain my current airspeed, and it took flight-idle power on the other motors just to keep from accelerating. Because we were about to fuel chop the No. 4 motor, I knew this situation could turn ugly if I wasn't ready to immediately add power on the engines at flight idle. When we agreed it was time to shut down No. 4, the flight engineer checked its fuel and ignition switches and fuel chopped the engine.

The aircraft initially yawed significantly to the right because of the increased drag produced by a windmilling, coupled propeller, but it then became controllable. We briefed the power-section oil pressure would be the dead giveaway of a coupled versus decoupled propeller. As advertised, the near-normal power-section, oil-pressure, post fuel chop indicated the propeller indeed had remained coupled to the engine. This too, is a good thing.

As I shot the approach, I noted almost no controllability issues, other then a larger-than-normal amount of power needed to maintain airspeed. The gouge numbers for a normal P-3 approach turn were useless, and I definitely was flying by the seat of my pants, using whatever power setting it took to put the aircraft in position to land.

As we touched down, I smoothly retarded the power levers to flight idle. I then placed the ailerons over the dead engine, with corresponding forward yoke pressure to aid in directional control. The winds were favorable for the reversal (right to left), but as I brought the power levers over the ramp and began a smooth reversal, I noticed the aircraft wanted to swerve to the left, more than what we train to. Faced with a situation that did not fit the gouge, I "flew the aircraft" and used the power levers and rudder as necessary to maintain centerline. I brought the aircraft to a stop with about 2,000 feet remaining. Ultimately, most of the reverse was done with the No. 2 and 3 power levers, with No. 1 remaining roughly at the ground-start position.

The entire evolution, from the instantaneous loss of prop fluid to landing rollout, took only 20 to 25 minutes. Postflight inspection found propeller fluid everywhere, coating most of the No. 4 nacelle and surrounding areas. The mechs who met us in the line said the prop had pitchlocked at 45-degrees blade angle.

The importance of chair flying cannot be overemphasized. Call it a preplanned response if you will, but having chair flown this malfunction endless times allowed us to take quick, correct action. We were confident we were doing was the right thing.

The adage "aviate, navigate, and communicate" has lasted for a reason. How many times have we read about some mishap when the pilots mixed up the order of the tasks? When an instructor tells you to "fly the aircraft," it's for a good reason. An overreliance on gouge can be dangerous when faced with a situation that calls for something other than the gouge. The expression, "Live by the gouge, die by gouge," is also a part of aviation lore for a reason.

I can't help but think "what if." What if, instead of pitchlocking at 45 degrees, the prop had pitchlocked at 20 degrees? What if, instead of pitchlocking 30 miles from home plate, it pitchlocked 700 miles from the closest divert? The list goes on. The challenge for all of us is to diligently prepare for these worst-case scenarios, so when they do happen, we'll take the correct actions and return home.

LCdr. Buser flies with VP-4.

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

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Same Sheet of Music

By Lt. Lucas Argobright

Our Hawkeye recovery aboard the carrier was a little more exciting than I had anticipated. Flying in Liberty 600, we had returned early to the overhead stack because we were done with our mission. While inbound, we saw the weather below 5,000 feet was not very good. We couldn't see the water or the boat. In the past, when the weather technically was not Case I, tower would push to make it Case I, because usually it's a more expeditious recovery than a Case II or III.

We checked in with marshal at 35 miles and stayed at 6,000 feet to remain above the weather. Approaching the carrier, we kept getting calls from marshal to report a "see me." We reported to marshal we did not have the carrier in sight, but we did have two Super Hornets off the nose. The FA-18Es also reported to marshal they couldn't see the carrier. We descended to 5,000 feet, the same altitude as our Rhino brethren.

In our air wing, the E-2C normally marshals at 4,000 feet with the Hornet squadron, so we generally talk to each other on a single tactical frequency to build our collective situational awareness in the stack. No other aircraft had checked in with marshal, so marshal decided to descend us to determine the weather overhead the carrier. We asked if we were clear to descend from present position. Marshal reported us clear, so we started a gradual descent. We entered the weather just below 5,000 feet and finally broke out at 2,700 feet.

Most carrier pilots quickly would realize a solid layer from 2,700 to 5,000 feet might not be the best weather for Case I, especially when aircraft marshal in the overhead stack at 3,000 and 4,000 feet. We reported a "see me" at 2,500 feet and 3 miles from the carrier. The visibility was about 3 miles in haze all around the boat. After talking with marshal, they kicked us to tower on button 1.

Marshal gave no warning to the incoming aircraft that four aircraft already were at 3,000 feet.

Knowing the weather and that multiple aircraft aren't going to hold overhead the carrier, we contacted tower to give them a pilot report (PIREP). We reported an overcast layer from 2,700 feet to 5,000 feet and that the FA-18Es were overhead at 5,000 feet and unable to descend to their normal 4,000-foot altitude.

Tower responded with, "Case I recovery, 3,000 feet and below."

Our initial thought was, "Here we go again."

There also have been times when the carrier wanted to push Case I recoveries when the ship's weather was questionable.

By this time, another section of F-18Cs had joined the overhead stack at 2,000 feet, and the FA-18Es had descended to 3,000 feet to join us. The copilot, still listening to marshal, heard two other squadrons checking in at 3,000 feet. Marshal gave no warning to the incoming aircraft that four aircraft already were at 3,000 feet. Hearing this, my copilot went up both squadron tactical frequencies and told them what was going on. They were very surprised to hear from a Hawkeye at 3,000 feet. Both the other squadrons were at 3,000 feet, 10 miles from the carrier, and they reported the carrier in sight around six miles.

We recognized a bad situation developing and coordinated to have all aircraft switch to a single tactical frequency to get everyone on the same sheet of music. Once on the same frequency, all aircraft reported their positions so everyone would know where to start looking. As it turned out, all 10 aircraft—yes, all 10 aircraft—were within four miles of each other. With all aircraft holding from point 4 (aft of the ship) to point 2 (forward of the ship) in the overhead stack, we coordinated separation to keep one another in sight. If the two sections that had checked in last had not been on the same frequency, the situation might have been a lot worse.

Crew-resource management (CRM) inside the E-2C played a critical role in the recovery of all aircraft during the event. The seven critical skills of CRM are decision making, assertiveness, mission analysis, communication, leadership, adaptability/flexibility, and situational awareness. One in particular, assertiveness, proved to be more valuable than the others.

The E-2C crew should have recommended Case II before 10 aircraft marshaled overhead the carrier at 3,000 feet. Eventually, all aircraft landed without incident. Once on deck, all parties were grateful the Hawkeye crew had noticed a very dangerous situation unfolding and acted quickly.

Lt. Argobright flies with VAW-115.

My First Combat Sortie

By Lt. Ryan F. Dillon

After years of training, I finally was ready to go in-country on my first combat sortie. I didn't know at the time that this flight would be an all-expenses-paid, week-long trip to Kandahar, Afghanistan.

As a squadron nugget, I have taken pride in being the proverbial fly on the wall. The senior pilots in the ready room often boasted about six-hour missions, dueling with the iron maiden, and the flurry of paperwork and cockpit management that awaited me in the skies over Afghanistan. I was eager and humbled by the opportunity to support our troops on the ground in Operation Enduring Freedom. Training was over, or so I thought.

The squadron started me off easy with a day launch and recovery on the wing of our operations officer. That morning, I felt excited, afraid, and overwhelmed. I was excited because I finally would get to exercise skills I had been refining for months. Fear of the unknown and of making a mistake kept me sharp during preflight mission planning. This hop would take me to a place I never had been before: the skies over a country where there was a real enemy.

As with any flight off the aircraft carrier, it's easy to feel overwhelmed by the sheer volume of tasks required of each flight. I vividly remember the skipper telling me that every flight encompasses an entire FRS syllabus: carrier qualification, tanking, air-to-air, and air-to-ground. He highly recommended I compartmentalize every piece of the flight from takeoff to landing. My plan was to get airborne, execute a running rendezvous on my lead, and comply with the transit procedures over Pakistan to my destination in southern Afghanistan. The next hurdle in my flight would be to in-flight refuel.

Tanking is my least favorite thing to do, and sure enough, we were scheduled for the iron maiden. The KC-135's basket is significantly heavier than any other refueling drogue I've tanked on, and I knew it had the upper hand on the probe of my vulnerable Hornet. The tactical portion of the flight seemed straightforward, considering the immense amount of training I did on our 8,000-mile transit over here. I think my flight lead was happy to know I would be a good wingman by

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keeping my ears open and mouth shut.

The brief was standardized and thorough. The subsequent element brief by my Ops O was just as complete. Before I knew it, and after a few parting shots about tanking on the KC-135, it was time to walk. I prepped my flight gear, complete with extra water, power bars, and piddle packs for the long mission. In keeping with the copious amounts of in-flight admin, paperwork, and mandatory reporting, I packed just about every checklist I could get my hands on. Regrettably, I recall inwardly laughing when my training officer said he includes a toothbrush and overnight bag with his gear. Soon, I would be the one butt of all jokes for not following his advice.

The start-up, launch, rendezvous, and push on the route all went as briefed. From one checklist to the next, I completed all the necessary operational-systems tests. The FLIR, laser, air-to-ground ordnance, expendables, and radios all worked as advertised. At last I was on my way.

The long transit was nice and allowed me to cage up for the next stage of the flight: my first tanker. We joined on Texaco 11 to get our mission-give. I intensely watched as my lead plugged and received his gas. It was so nice having an opportunity to see the dreaded iron maiden during daylight hours. Lead pulled out of the basket once satisfied, and I plugged in. Like a seasoned veteran, I took my gas without any problems and proceeded on the assigned tasking.

Do you remember the first time you heard the ATIS broadcast in the training command and how fast the prerecorded information flowed into one ear and out the other? This is how I felt checking in with Murmur *22*, the joint-tactical air controller (JTAC). I heard less than half of what he said. To make matters worse, while frantically trying to copy down everything verbatim, I suddenly was distracted by the aural warning, "Engine left, engine left." Bitching Betty strikes again.

I quickly stopped writing and scanned my engine instruments. Everything appeared normal, and all associated warning and caution lights were extinguished. As soon as my lead was finished checking in with the JTAC, I filled him in on what I just had experienced. A reassuring, "We'll keep an eye on it," was the reply.

As fate would have it, just as communications with Murmur *22* picked up again, I felt a sudden loss of thrust from my left engine. Again, Betty paid me a visit with the usual, "Engine left, engine left."

My heart sank. This malfunction was the most severe I ever had experienced outside the simulator. I executed the boldface procedures in accordance with NATOPS and then told my lead of the engine malfunc-

tion. The rpm rapidly dropped off, and EGT remained fairly steady on my instrument panel. With the left throttle at idle and rpm close to 40 percent, the engine automatically relit. The engine's rpm crept back up and stabilized at flight idle—around 70 percent.

"Sting 33, 34. The engine looks good at idle," I passed. Just as quickly as we had checked in, lead was forced to check right back out with Murmur, citing engine problems.

After putting the tanker on the nose, we broke out the pocket checklist (PCL) in a challenge-reply fashion. Although I did not see a flameout caution illuminate, all of the secondary indications pointed to just such a malfunction. We began to troubleshoot. Because the engine automatically relit, the checklist suggested evaluating the engine's response at altitude and landing as soon as practical.

I slowly started to bring up the left throttle from flight idle to mil. I didn't see, hear or feel anything out of the ordinary. However, as I retarded the throttle back through 80 percent, the jet noticeably began to shake and bang. I again brought back the left engine to idle and elected to use only the right one. It took a lot of rudder trim to compensate for the idle motor. The plan was to head south, get some gas, and return to the carrier for the next available recovery.

Aside from the random shakes and bangs from the left engine, the jet flew as expected. Much to my dismay, I slowly was decelerating from the loss of thrust and desire to maintain assigned altitude. I couldn't descend because other aircraft were operating in and around my section. My flight lead also throttled back and began to fly formation off me.

As I decelerated through 230 knots, he emphatically called, "You can't keep decelerating; use blower to keep your speed up." Why didn't I think of that earlier?. Clearly, my bucket rapidly was filling up.

Our fuel state was too low to permit a direct flight back to the aircraft carrier. We continued marching toward Texaco 11. Lead took port observation, while I positioned myself in precontact behind the iron maiden. The KC-135 crew accommodated my airspeed requests. My first inclination was to tank at 240 knots. However, speeds closer to 230 knots were much more amenable to having one engine at idle and the other at mil. Even this speed required a little afterburner to maintain precontact and ease into the basket. Staying in the basket was a different ballgame, as it took a lot of blower to maintain contact. I finally realized the left engine might provide a little relief, so I eased it up toward 80 percent. This move alleviated the requirement for afterburner and allowed me to stay in the basket with the right engine at or close to the mil stop.

The left engine was not happy to be back in the game. The vibrations grew more violent, with even louder bangs and pops. It was all I could do to stay in position on the iron maiden, praying that I wouldn't rip off my probe. Did I mention how much I disliked tanking?

The vibrations grew more violent, with even louder bangs and pops.

I soon had enough gas to make it to the carrier, plus a few practice approaches, if necessary. I placed the left throttle to idle, disconnected from the basket, and moved over to the right wing. Because I was on the right wing and thrust limited, it made sense the tanker would turn left.

"Tanker coming left," I heard.

I was now on the outside of the turn; not even min-blower could keep me on bearing line. Despite the left engine's earlier desire to remain at idle, I tried to bring the throttle back up mid-range to help maintain starboard observation. As expected, the severe vibrations, bangs and pops resumed.

Do I make a play for the boat or divert in-country? That was the million-dollar question. The engine appeared to be getting worse, even at idle. Whether the deteriorating condition of the left engine was induced by its subsequent use or not could be debated, but right

then, I had to get this jet on deck. Almost instinctively, I selected Mk 8 with my navigation system, putting Kandahar Airfield about 60 miles off my nose. With the engine feeling like it was coming apart, I did not wait for lead to finish taking his gas before I left. Fortunately, for me and my sanity, he was finished about a minute or two later and followed in trail. I must admit, our crew coordination was excellent—even better than I remember during my annual NATOPS checks.

I focused on flying a good airplane, while my lead took care of the coordination with Kandahar Approach. My approach plate exactly was where I had put it in my nav bag, and I quickly strapped it to my leg. Once comfortable, we broke out the PCL again to review the single-engine approach and landing procedures. The first step was to reduce gross weight by dumping excess fuel—done. Next, plan to land using half-flaps. Although not used very often, this flap setting was not a big deal.

Completing my ship-to-shore checklist was next: anti-skid was turned on, lights remained off, and my tailhook was in the retracted position. Kandahar Airfield consists of a single, 10,000-foot runway, complete with long-field arresting gear. We had plenty of concrete and a good headwind. Everything was going to work out just fine.

Kandahar Approach began vectoring me in on a wide downwind for runway 23. The lower, denser air was welcoming. I finally could avoid the use of afterburner to maintain level flight. In fact, I used the descent to accelerate to a much more comfortable 300 knots.

Approach control passed the weather, altimeter and duty runway, calling, "One-mile visibility with dust and haze."

However, the airfield looked like a giant dust bowl, with almost no horizontal visibility. My lead recommended designating the end of the runway as a target, using my FLIR for situational awareness—a great idea. Rounding left base and on the final-approach course, I drove in level until my designation (diamond) was three-degrees nose down. I then tipped over and established a standard final descent into Kandahar. I cannot recall ever hearing approach telling me I was on glideslope. My lead also suggested flying the approach slightly fast (you know, a little extra for the wife and kids). That little extra was not a problem, and aside from the increased safety margin, it made the jet feel much more controllable.

I did not fly my best Hornet controlled approach: I was high and fast the entire way down the chute. Then, just as weather predicted, I broke out the landing area at one mile. I needed a little maneuvering to get on centerline and a lot more finesse to do something few carrier aviators do: flare to land. With carrier-pressurized tires under me, the last thing I wanted to do was plant my jet on the runway and risk blowing a tire.

A great feeling of relief came over me. I had no problem meeting my line speeds and found myself at a safe taxi speed in no time. I passed a "safe on deck" call to lead, and he departed for the ship. I am sure he heard the relief in my voice, but he didn't know about my shaking knees.

I requested a hot-brake check with the ground controller. This request was OK because the local crash trucks got a heads-up when I was inbound. I saw several vehicles with flashing red lights speeding toward my location. I sat and waited in the flat, desert environment of Kandahar. I remembered not to set the parking brake because my brakes could be hot. I even shut down the left engine for fear of causing more damage. Besides, I certainly didn't need it on deck. Sure enough, the signal from the crash crew indicated my brakes were hot. As if in a game of hurry up and wait, my Hornet and I sat at the end of the airfield for 20 minutes surrounded by blowing fans.

My first combat sortie ended up being a lot more exciting than I ever had imagined. I learned a lot about compartmentalization, crew coordination, and the importance of systems knowledge. It is true what the many simulator instructors and NATOPS evaluators say about the Hornet, "It flies just fine on one engine." As long as you know your procedures cold, I believe you'll be able to handle any complex emergency thrown your way. Most importantly, I now fly with a toothbrush and overnight bag.

Lt. Dillon flies with VFA-113.

Single Engine Over Baghdad

By Cdr. Jeff Hyink

My wingman and I departed the right wing of the KC-135 tanker and climbed 1,000 feet to clear the tanking stack. As we cleared the tanker's airspace, I swung the nose of my FA-18C eastward toward Baghdad, the site of our Operation Iraqi Freedom (OIF) tasking. As I accelerated away from the tanker track, I heard an unwelcome "thud, thud, thud" from behind the cockpit, followed almost immediately by a chorus of "deedle-deedles" from the master-caution circuit. It was going to be an interesting mission.

Photo composite image.

We had launched on a midday, standard OIF mission and were fragged to support a joint-tactical-air controller (JTAC) on the ground in Baghdad. These missions were routine as we neared the halfway mark of our deployment. My aircraft was equipped with a standard air-to-ground load, including two drop tanks and two 500-pound-class weapons. Weather in-country over the past few days had been marginal, because of recurring summer dust storms blowing from Syria. These storms limit visibility over much of the country. We just had topped-off on our first of three air refuelings before entering our tasked airspace. Then the admin of recovering became our mission focus.

I stared at the engine instruments and tried to assimilate the cautions that stacked up on the left DDI. The right engine rpm dropped steadily, even though the throttle remained at military power. I pulled the throttle to idle and maintained momentary hope the engine would relight. Spooldown, restart, right? What causes the engine to do this anyway? No such luck: no restart.

The engine continued to spool down to 10 percent, and I told my wingman my right motor had flamed out. I pulled the throttle to the off position. I asked to orbit

at my present position, while we tried to sort out the problem and consider options. We were about 100 miles from Al Asad, our preplanned divert in-country and well past 400 miles from mom. I wasn't enthused about dragging a single-engine Hornet that far south, with an engine that "flamed out for no apparent reason," while expecting a heavy, single-engine pass in summer Gulf conditions. I continued the orbit back to the north and put Al Asad on the nose.

I queried the airspace controller for an updated weather report for Al Asad. Our preflight brief had said to expect intermittent IFR because of dust storms. The controller quickly said that Asad had had around one mile of visibility on the last observation. This info passed my sanity check. We started a descent, as mil power on the good engine wasn't keeping the fully fueled and loaded Hornet level in the mid-20s. We discussed cause and effect within the flight.

I asked my junior wingman to join up and give me a good belly check, looking for evidence of problems—nothing. After I adjusted weight, my trusty wingman started to back me up on the procedures for a single-engine landing. We decided to try to momentarily motor the right engine, just to see if the hydraulic system on the right side was available for normal gear extension and braking—fortunately, it was.

As I checked in with approach control, things started to happen fast, forcing us to quickly consider of our options. The visibility was a little less than a mile, and the precision-approach radar (PAR) was down. So, we would fly a surveillance approach to minimums, into a glowing orange and brown sunset of a dust storm, to a dusty runway, surrounded by, well, dirt.

After a frantic search of the pocket checklist (PCL) for engaging speeds and weights of the nonstandard M31 arresting gear, I adjusted down to a reasonable fuel weight that would give me an option of going around. I would prefer to keep the jet on the long runway if I skipped the gear and use normal braking techniques with the jet's carrier-pressurized tires. I turned to final, cranked the right motor, and after getting three-down-and-locked, energized the APU to allow normal braking, if required.

The runway had a decent, newly installed approach-lighting system, which significantly lowered my stress level on short final. The calm quickly was overridden as the lens broke out, but I couldn't immediately locate the arresting gear that was promised. My second scan showed the arresting-gear wire actually was in front of the lens position on the runway. A minor, single-engine, power correction later, and I pulled out the wire.

This adventure produced several learning points. First, single-engine landings in the Hornet, with the right motor secured, present a handful of options that are much clearer during 1 G, on-deck training, than in a foreign country in a sandstorm. Crank the motor? Landing weight that requires a flare with a heavy jet? What to do with the nosewheel steering (NWS) without HYD2 online?

The visibility was a little less than a mile, and the precision-approach radar (PAR) was down. So, we would fly a surveillance approach to minimums, into a glowing orange and brown sunset of a dust storm, to a dusty runway, surrounded by, well, dirt.

Second, you need crew coordination to cover approach options, runway lengths, and go-around options to reach (or at least QA) the best plan of action.

Last, I validated the "little note" on the EPs about how restarting the APU in flight may scorch the fuselage and activate the fire element because of exhaust. On postflight, significant scorching was noted behind the APU exhaust, along with a singed fire element that probably was close to popping a caution, which certainly would have multiplied the pucker factor. The engine also had an auxiliary gearbox that had eaten itself up, killing the boost pump and all hope of any relight.

Five days with the Marines in the desert, eating food somehow better than wardroom 3, and a new engine later, I brought the dusty jet back to the carrier with a freshly "decorated" tailhook, courtesy of my stellar hosts.

Cdr. Hyink is VFA-151's executive officer aboard USS *Abraham Lincoln* (CVN-72), with Carrier Air Wing Two.

An Urgent Situation

Photo by SCMCS (SW/NAC) Spike Call.

By Lt. Brandon Sheets

Photo by SCMCS (SW/NAC) Spike Call.

While the USS *Ronald Reagan* (CVN-76) CSG was on a routine deployment in the Pacific, typhoon Fengshen tore across the Philippine Islands, leaving a wake of destruction. Fengshen caused an estimated 1,400 deaths and $240 million in damage before it downgraded to a tropical storm. One island, Panay, particularly was hit hard, having many areas completely isolated because of downed power lines and massive landslides. Many homes were destroyed or filled with mud, and the people were left with no fresh water and little food. Within 11 hours of receiving the order, the *Reagan* CSG began HA/DR operations for the people of Panay.

Helicopter Anti-Submarine Squadron 4, of Carrier Air Wing 14 (CVW-14) aboard *Reagan*, took on the immediate task of planning this inland relief mission.

The Black Knights of HS-4 and helicopter detachments from HSL-49, HSL-43, HSL-37, and HS-10 were called upon to react quickly and safely. Obvious risks needed to be addressed: unfamiliar operating areas, fuel, distances, airspace deconfliction, aircraft-weight limits, crew rest, and the safety of the population in and around the landing zones (LZs).

The greatest contributors to mitigating these risks were team-centered attitudes and continuous communication between all parties. Daily lessons learned were shared among helicopter squadrons, detachments, CSG surface ships, and the ground crew based at Iloilo International Airport. The air-wing deputy commander, Capt. Thomas Lalor, was point man for the ground crew as they worked closely with the Philippine military to decide LZ priorities and what supplies were going where.

Photo by MCS2 Jennifer S. Kimball.

Aircraft flew sunup to sundown to deliver much-needed supplies, including bottled water, water purifiers, rice, and sanitation kits. The helicopter crews loaded supplies at Iloilo International Airport and flew them to locations all over the island. Some of the LZs were located deep in dense jungle, otherwise only accessible by foot trails. Others were pinnacles or confined-area LZs, with just enough room for a single helicopter.

Several specific mitigation measures were put in place to manage risk. The Philippine Army was consulted for identifying obstacles and places to avoid. Operations were conducted only in daylight, and LZs were evaluated real-time for possible risk and assigned appropriately. CSG ships were staged conveniently around the island, providing ready-decks for refueling. To deconflict airspace, altitude blocks were used, as well as a helicopter common frequency that all participants used to update their positions.

Designed to project power, control the sea, and establish a substantial military presence throughout the world, a U.S. Navy carrier strike group (CSG) is arguably one of the most powerful conventional-weapons systems ever developed. The CSG is the president's most flexible and potent option in times of crises, be it military operations or humanitarian assistance/disaster relief (HA/DR).


Photo by MCS3 Kathleen Gorby.

Helicopter course rules were instituted at Iloilo International to provide situational awareness and an orderly traffic flow in and out of the airport. The LZs often were crammed with people wanting a glimpse of the helicopters, which put them at risk of injury from a variety of things. Whenever possible, the LZs were secured by the Philippine army before helicopters landed to make sure the safety of the local population. By taking the time to brainstorm and discuss operational risks associated with the mission, the CSG effected a strong HA/DR presence with zero mishaps.

Every helicopter was pushed hard all day and had to be ready to go early the next morning. Because of the job by maintainers, the helicopters performed flawlessly, with no mission aborts for maintenance.

This mission was much more than just delivering supplies. The Philippine people witnessed firsthand the U.S. military's readiness and willingness to help its friends and allies in a time of need. An immediate bond developed between our Navy and the Philippine Army as a result of the urgency of the situation and the numerous lives that were saved. Capt. Lalor stated, "This has been one of the most rewarding operations for me in 24 years in the Navy." That statement was true for all of the participants.

Lt. Sheets flies with HS-4.

Photo by MCS3 Torrey W. Lee. Modified.

The Missing Holdback Fitting

By LCdr. Mike Garrick

This tale recounts a flight I cancelled, but the story begins two flights before the event in question.

My squadron was five months into a seven-month cruise to the Arabian Gulf, and we already had flown more than 150 sorties in support of Operation Iraqi Freedom. Despite operating the four oldest aircraft in the air wing, we had managed to avoid cancelling a single combat mission through a combination of maintenance ingenuity, operational flexibility, and a little good fortune.

On the day in question, I was scheduled for the night event in-country, with one ECMO from my regular crew and one from the air-wing staff. We briefed the now familiar mission and began getting our gear in order. At this point, our guest air-wing ECMO realized he was missing a holdback fitting from his helmet bag.

How did the holdback fitting get into his helmet bag? Let me turn back the hands of time to the day earlier. The aircraft had flown a combat mission into Iraq on the first event, which also was our new pilot's first flight over the beach. Afterward, as our maintainers busily turned around the jet for the evening event, our skipper found the holdback fitting still in the adaptor, removed it, and gave it to a troubleshooter. Seeing an opportunity to provide the new pilot with a nostalgic reminder of his momentous first combat sortie, my ECMO grabbed the fitting from the maintainer and put it in one of the outer pockets of his helmet bag. When the jet trapped several hours later, the bag flew forward and flipped upside down on the unoccupied right backseat (the ECMO 2 position). It didn't occur to my ECMO to inventory the contents of his bag after the flight.

Fast forward to the day of our scheduled flight. My ECMO realized he was missing this rather significant hunk of metal about 1.5 hours before our takeoff time but after the jet already had flown. Despite the bad timing and professional embarrassment, my ECMO reported what he knew about the last known whereabouts of his suspected FOD. He immediately searched his flight gear, the ready room, and his stateroom, but came up empty.

As we walked to the aircraft, maintainers feverishly searched for the FOD, but given the short search time, they didn't remove floorboards from the cockpits as they normally would. No doubt feeling rotten about

the situation, my ECMO tried to helped look for the holdback fitting.

As soon as I could, I climbed into the aircraft to talk with tower about our status. As the minutes clicked by, the likelihood of our launching on time began to dwindle. Tower said the jet would need to be respotted forward of the island for the recovery, and we would launch late if the jet came up.

I rode brakes for the trip up the flight deck. Once the aircraft was chocked and chained, our maintainers resumed their search. Our representative in the tower told me the AMO (MO was flying) would sign off the FOD discrepancy if maintenance couldn't find anything. He reasoned something the size of a holdback fitting probably couldn't migrate under the Prowler's floorboards, and the crew, who just had flown the aircraft, would have heard or felt the fitting rattling around in the cockpit. Moments later, however, the AME CDI told me that, although he hadn't found anything, he couldn't be sure the cockpit was FOD-free without removing the floorboards. Too bad these situations can't ever be black and white.

We were at crunch time, and the recovery had commenced. The remainder of my crew was manning up, and both the flight-deck control (FDC) and tower were pressing me to start engines. We precariously were close to scrubbing our first OIF mission, and denying essential EW support to units in Iraq. Tom Selleck's character, Magnum P.I., used to talk about his little voice whispering to him—mine was screaming. As I thought through the scenario over and over, I kept coming back to two facts: We were 100 percent sure the holdback fitting had been in the aircraft, and we were 100 percent sure we did not know where it was.

I asked the crew what they thought, and they didn't like the situation any more than I did, but as aircraft and mission commander, the decision was mine to make. I decided the aircraft was down and told tower we were done.

We walked back to the ready room, into a stream of questions from the CO. Understandably upset by the situation, he asked me to explain my reasoning. All I could give him was my gnawing hunch, and the fact that, when I was the MO, I would not have signed off a discrepancy for a known piece of FOD without first pulling floorboards.

Fighting back his frustration, he summarized my rather weak explanation by asking, "So, as the aircraft commander, you decided we had not conducted a sufficient FOD search."

I replied, "Yes sir," and he headed off to talk to CAG.

The next few hours were tense, as we worked to deal with the fallout from the cancellation. I had begun to question my decision when the maintenance-control senior chief walked into the ready room and presented the holdback fitting to my ECMO with a respectful but appropriately surly admonition not to let it happen again. They had found the holdback fitting under the ECMO-2 floorboards.

What have we learned? Don't take anything into the cockpit that you don't need, and inventory what you do bring. If you lose something, confess as soon as you realize it. In this case, my ECMO's fault was on the first point, not the second. He did right by telling someone he might have FODed the aircraft, but he definitely should have realized his mistake before the aircraft went flying again.

Sometimes, you have to stand up and make a call in the face of significant resistance. Nobody involved wanted to send us flying with a piece of FOD in the cockpit, but jet status, the timeline, and pressure to execute made everyone want to believe the FOD issue adequately had been mitigated. My crew's decision not to take the jet flying might have been the last hole in the last "slice of Swiss cheese" standing between the squadron and a mishap.

Whether you call it the hair on the back of your neck or your little voice, pay attention to your instincts when they tell you things aren't quite right. It might just save your life.

LCdr. Garrick flies with VAQ-130.

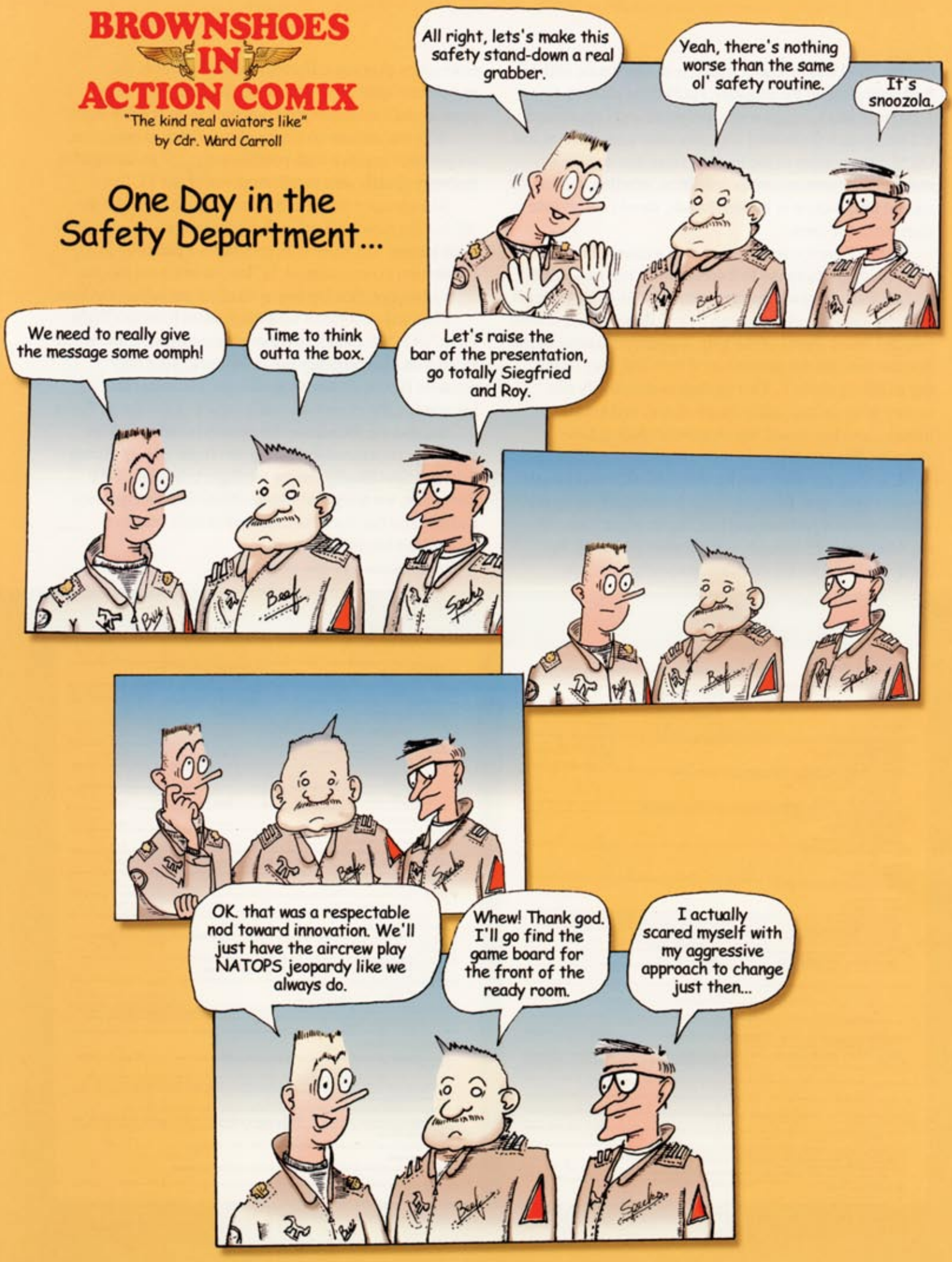
Mishap-Free Milestones

VP-9	30 years	180,000 hours
HSC-28	10 years	56,000 hours
HSL-47	10 years 8 months	47,000 hours

BROWNSHOES IN ACTION COMIX

"The kind real aviators like"
by Cdr. Ward Carroll

One Day in the Safety Department...



BASH

www.safetycenter.navy.mil/aviation/operations/bash/index.asp