THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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Approach

CRM

DECISION MAKING

ASSERTIVENESS

MISSION ANALYSIS

COMMUNICATION

LEADERSHIP

ADAPTABILITY/FLEXIBILITY

SITUATIONAL AWARENESS

The Navy & Marine Corps Aviation Safety Magazine

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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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C O N

Features

Focus on Crew Resource Management (CRM)

This issues features three articles which highlight the critical skills of CRM. The first two articles are written by LCdr. Brendan O'Brien, the Director, Crew Resource Management at the Naval Aviation Schools Command. His first article discusses how the critical skills are interwoven into through one of his flights. His next article discusses how CRM can add value to a safety resource. The third article is by Lt. Zachary Miller of HSM-71. Elements of CRM can be seen throughout his story; a lot can happen in 14 minutes.

NTENTS

Photo by MCS2 David Hooper. Modified.

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Departments

Front cover: Multi-mission MH-60R Sea Hawk helicopters fly in tandem during section landings at NAS Jacksonville, Fla. Photo by MC2 Shannon Renfroe.

Back cover: "You are responsible," safety message. Photo composite by Allan Amen.

July-August Thanks

Thanks for helping with this issue…

LCdr. Matthew Martin, HSM-71
Lt. Frank McBride, VT-86
Lt. Jeremy Severson, HSL-48
Lt. Benjamin Walborn, VR-58
Lt. Steve Kukla, VAQ-133
Lt. Ean Hobbs, HSM-40
LCdr. Ernest Anderson, VFA-195
Capt. Alain Martinez, USAF, VAQ-140
Lt. Mike Glynn, VP-16
Lt. Stephen Huffman, VFA-32
Capt. Clark Noble, USMC, HMH-462

CRM

Elements of Crew Resource Management can be seen in most articles published in *Approach*. This article is written by the Director of the Navy's CRM school, and shows how CRM was critical to one of his flights in the training command.

—Editor.

Clearance, We Don't Need No Stinkin' Clearance!

BY LCDR. BRENDAN O'BRIEN

There are two types of pilots in the training command: Those who have had and those who will have overspeeds, over-G's, overtorques, hard landings, flat tires and takeoffs without a clearance. Wait. Taking off without a clearance? But that's not supposed to be possible. We've got way too many checks and balances for that to happen. We've got checklists. We've got radio procedures. We're hard-charging, smart, head-on-a-swivel, multi-X makin', multi-crew instructors. Who could possibly takeoff without a clearance?

This guy, that's who. I was a new T-6A instructor pilot (IP) at VT-4, training Naval Flight Officers during the transition from the venerable T-34 to the Navy's next generation trainer at NAS Pensacola. While I had nearly a year as a T-34 IP, this was my first flight with a student in the T-6A.

When you're given a shiny new airplane, it's easy to get lost in that new plane smell. When you're teaching a new syllabus to boot, it's possible to start lining up the holes in Reason's Swiss cheese model.

The brief for that day's event was unremarkable for several reasons. First, the event was a run-of-the-mill instrument hop; the first in the plane for my student after a couple of weeks in the HiFi simulators that come with the JPATS system. Second, my student was what I would call all around "fleet average." Lastly, we had no adverse weather or time constraints.

From an ORM perspective, this flight was as low risk as a training flight can be. He had showed me enough knowledge, preparation, and planning that I was willing to take him flying. I felt confident that my training in the flight instructor training unit (FITU), coupled with my experience as an IP for nearly a year would keep us out of trouble. Here's where my **leadership** skills would be important.

The preflight, strap-in and startup were equally unremarkable. We received our clearance to taxi and we were off. Instead of the midfield takeoff normal to T-34 ops, we went all the way to the end for a full-length takeoff. Arriving at the hold-short lines, we commenced our run-up. After finishing, my student called for take-

off clearance, but because there was traffic lining up for the break on the right, we were told to continue holding short of runway 7R. The wait started to drag on as more T-6s, a couple of T-39s, and a section of T-2s called for the overhead. All told, we were holding short for just over 10 minutes, not an uncommon experience when your takeoff time coincides with the return of all the aircraft from the first cycle of the day. When the T-2s landed, we were given clearance to position and hold (aka "line up and wait"), which the student read back to tower. I had my established habit patterns as an IP, but my **situational awareness (SA)** broke down and the wheels started to come off.

My normal habit before takeoff, in addition to the required lineup checks, was to quickly grade the student's ground work and communications as they called for and executed the takeoff checklist. I had a few more things to write than normal, so my head was down longer than usual. As I finished my items, I picked up my head and cleared the approach corridor before pulling out onto the runway. We lined up and I brought up the power control lever (PCL), out of idle and got set for one last check of engine parameters. Here's the trouble with that action: Despite hearing the clearance, including my student's correct read back, I brought that throttle up with full intent of pushing it to max and taking off. I had completely lost SA on what my clearance was. I hadn't written it down. It was as if, when I got my head out of the cockpit as we took the runway, it was a brand new day.

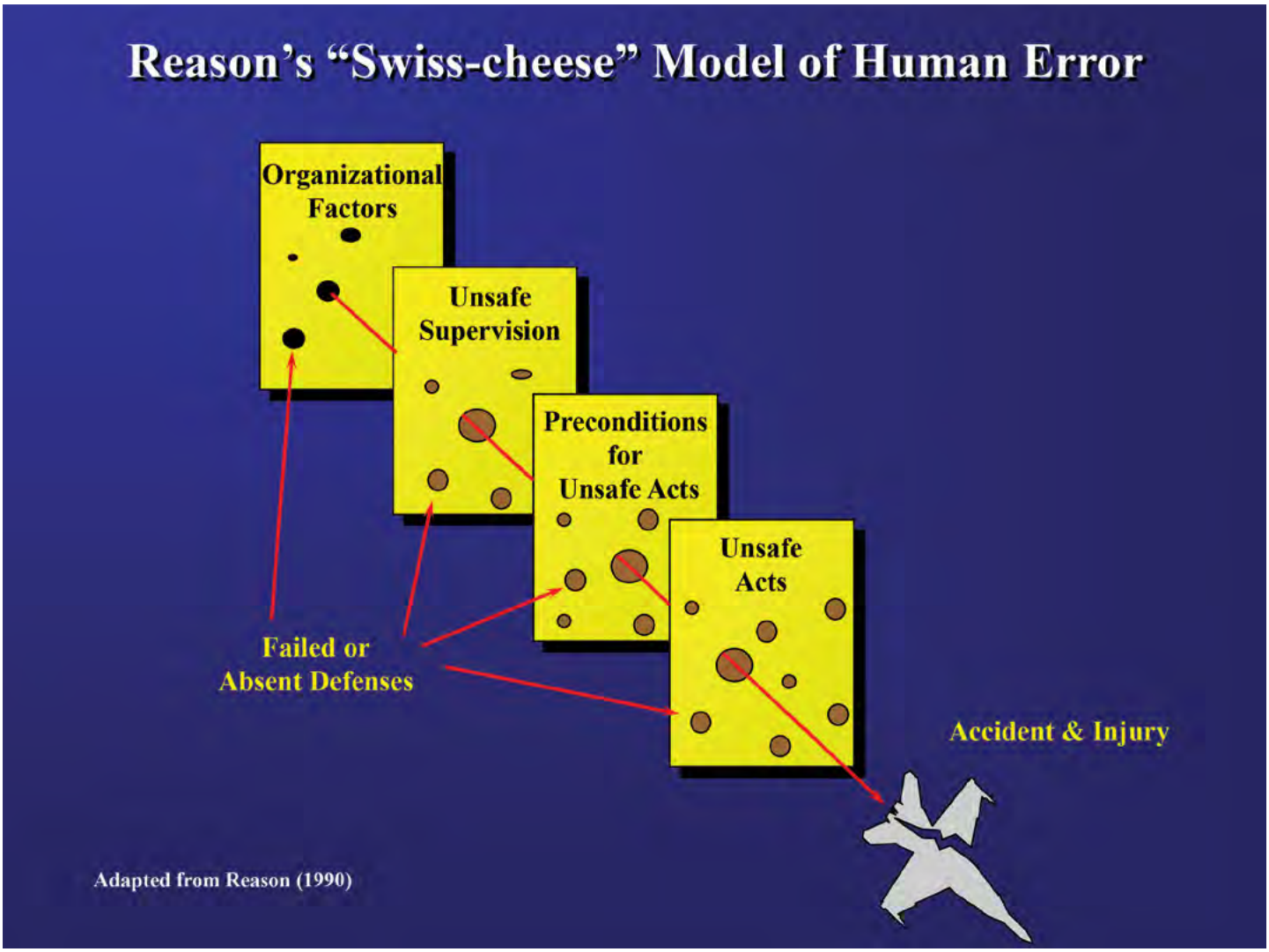
So, trundling down the runway we went.

"A/S off the peg."

"Approaching 85 knots. Rotate."

"Sir, Two positive rates of climb."

"Buck 316, you were not cleared to take off! I need an immediate turn to 150. Contact departure.



The CRM Team

The Crew Resource Management Instructor Course and Program Office, a department of the School of Aviation Safety (SAS), is currently part of Naval Aviation Schools Command located aboard NAS Pensacola. At the beginning of FY14, both SAS and CRM will become part of the Naval Safety Center.

The move to the Naval Safety Center also brings an expansion of the program from its current aviation focus to all communities. The goal is to significantly increase mission effectiveness by identifying/eliminating hazards, increasing team coordination, minimizing error, and creating an operating system that's flexible enough for any warfare specialty.

The CRM Office is responsible for execution of the directives set forth in CNAFINST 1542.7 (Dec '12) and provides:

- Education and qualification of Naval Aircrew and Civilians as CRM Instructors (CRM-I's) by instruction in the History of CRM, Program Management, Workload Management, Threat and Error Management, Teamwork, Human Factors, Instructional Strategies and Techniques, and an in-depth, ground-up look at the 7 Critical Skills of CRM. The four-day course, provided roughly twice per month, emphasizes thorough case study development and presentation.
- A Mobile Training Team, available for off-site CRM-I training in Fleet concentration areas requesting it. Funding will be provided by the requesting command(s).
- Instruction of Joint and International Partners.
- Oversight and Compliance with applicable directives in the form of annual (to biennial) Assist visits.
- Distribution of CRM Materials to Fleet entities.

For more information on class quotas or Program Management, the CRM IMM can be contacted at http://www.netc.navy.mil/nascweb/crm/crm.htm

Well, then, what are the lessons of the day? How could I possibly have prevented those specific slices of Reason's model from lining up to bite me in the butt? One thing I know for certain is that I was fortunate to not have caused a mishap. There could have been crossing traffic exiting the runway in front of me. Even though I might have ejected successfully, along with my student, what about other aircraft in my path? A T-39 perhaps? Airborne, or not, there would be no getting out if that were the case.

Each and every misstep made by me and my student that day had its roots in a CRM failure. Our first failure lies in **mission analysis** in the preflight ORM process. As do most commands, VT-4 used an ORM checklist to codify and mitigate the risks associated with a particular mission. Using a grading sheet, the IP and student could run through the weather, mission elements, and human factors to cover just about everything. Here's the kicker, one of the possible results is "low risk." When compared to some of the other missions we do, our flight just might have been estimate to be "low risk." But the reality is that giving a naval aviation training event any name other than "risky" can possibly send the wrong message. Might "acceptable risk" be a better phrase when doing mission analysis?

I firmly believe that my loss of SA was rooted, at least in part, in the extra-long delay in receiving our takeoff clearance. One of the least understood barriers to effective SA is task underload. Long missions and unexpected delays are just as serious a threat to SA and **decision-making** as are task overload, stress, get-home-itis and decision bias. After a while at the hold short, I'd started to zone out. In an ever-changing environment there is the need to be **flexible and adapt** to the situation.

Clearly, there was also a failure of **assertiveness**. Although my student knew what we had been cleared for, illustrated by the fact that he'd read it back to tower properly, he wasn't willing or able to challenge me as the IP after I brought the PCL up for takeoff. We hadn't, up to that point, experienced any specific challenges in **communicating** and, while I'm not the domineering sort, there is a definite cockpit gradient in the training

command. Sometimes, there exists the impression that the instructor pilot is infallible. Some students allow that impression to cloud their judgment when it comes to safety-of-flight issues. They are prone to sitting on their hands when the IP gets off the script.

Some of the things that happened to us that day are eerily reminiscent of the biggest air disaster in history prior to 9/11.

The Atlantic Island of Tenerife is the site of an aircraft mishap that claimed the lives of 583 passengers and crew aboard two Boeing 747s that collided on the runway at Los Rodeos Airport after a series of errors and misperceptions caused KLM's most senior pilot to begin a roll down a fog-shrouded runway and, just after rotation, hit a Pan Am jet scrambling to make it clear to the taxiway. Details of the "Tenerife airport disaster" can be found on the Internet.

While I didn't cause a major mishap, my error is no less egregious than the pilot at Tenerife. Still, the lessons learned that day in Pensacola are never lost on me; lessons that are especially pertinent as the third and final Training Wing accepts the T-6B.

The battle for safe, effective mission completion is won with eternal vigilance. Complete adherence to the principles of CRM — the seven skills — in all phases of operations is the key. Paramount to that adherence is understanding the interrelationship between those skills. There is no preeminent skill, and that the success of any one is directly determined by the success of the other six.

CRM exists most successfully as a primary operating system (OS). Once you set foot on that flight line, everything you do through the proper use of CRM is a direct link to a successful mission. Every misstep in the CRM processes is just one more hole in the Swiss cheese. Whether it's running in the foreground during an emergency, or in the background as "the way we do business," CRM is the linchpin for successful time critical risk management (TCRM) and the seven skills are the best set of tools for achieving the goal of effective mission completion.

LCDR. O'BRIEN IS THE DIRECTOR, CREW RESOURCE MANAGEMENT (CRM), NAVAL AVIATION SCHOOLS COMMAND. HE FLIES AS AN INSTRUCTOR PILOT WITH VT-10. HE CAN BE CONTACTED AT BRENDAN.OBRIEN@NAVY.MIL.

"Better CRM Through ASAP"? Or is it, "Better ASAP Through CRM"?

"Aviation in itself is not inherently dangerous. But to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect." — Captain A. G. Lamplugh

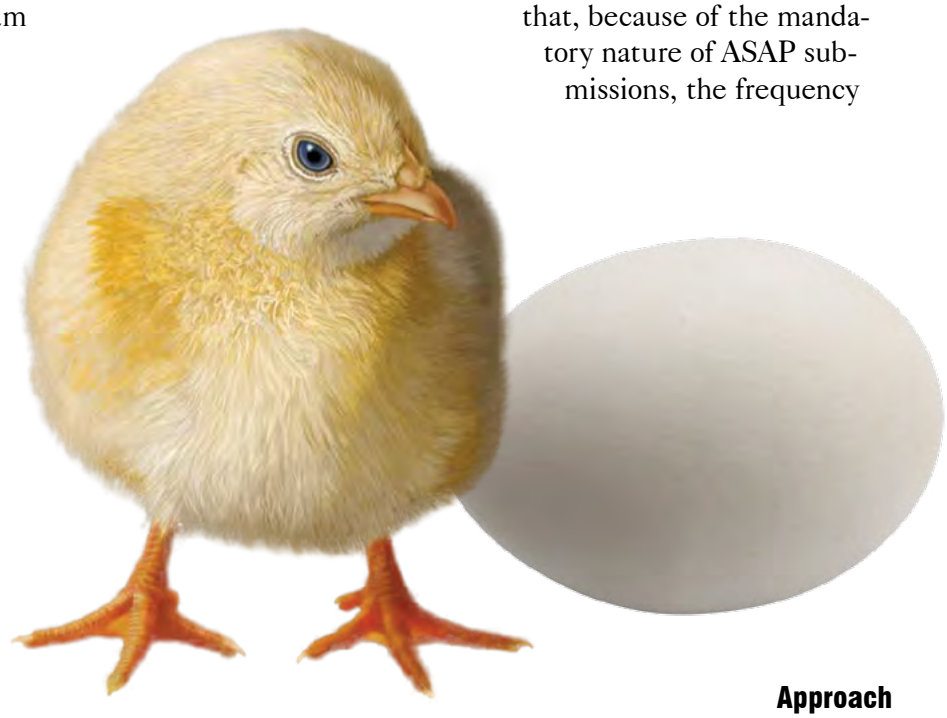
BY LCDR. BRENDAN O'BRIEN

"RATS! I FORGOT TO DO my postflight ASAP report again. Oh well, no big deal. I'll get it next time."

As with any requirement that insists that you sit down at a computer and write about things that you possibly did wrong or about things outside of your control that went wrong during a mission, CNAF's Aviation Safety Awareness Program (ASAP) asks that we take yet more time to enter data that "Nobody's gonna' look at anyway." Right? Really! Who wants to spend more time fighting NMCI or TRANET right after you've already been battling it for an hour just to get your WINFLIR or your SHARP/TIMS grade sheet entered?

Let's get one thing straight right out of the box: Any or all information you enter into ASAP sees the light of day. When you hit "Submit," you're alerting your squadron or wing that something's amiss. It doesn't necessarily need to be worthy of a hazard report (HAZREP), but it does allow everyone up the chain of command to assess trends that might cause a mishap. Also, there have been positive, tangible results generated from your submissions.

The other side of the coin is that, because of the mandatory nature of ASAP submissions, the frequency



Even when we execute our mission as we briefed, do all our procedures according to NATOPS, something can always go wrong.

of reports with actionable information is less than ideal. This situation has gotten so bad that some folks have written desktop macros that will let them sign in to ASAP and submit "No Significant Event" with one click of the mouse, just to be able to say that they've met the requirement.

Fleetwide ASAP submissions in a 12-month period beginning in November 2011, numbered almost 209,000. Of those, only about 17,800 contained reportable information. The other 92 percent reported no significant event. What that tells me is that of our hundreds of thousands of annual flight hours, 92 percent of the time, "It's all good." That number flies (no pun intended) directly in the face of the quote, above, from Capt. Lamplugh. Kinda' doesn't feel right, does it? It doesn't feel right because we know that the odds are stacked against us. Even when we execute our mission as we briefed, do all our procedures according to NATOPS, something can always go wrong.

Here's an example from two events I flew. I had three separate ASAP reportable items: ATC problems, weather other than forecast, and a mechanical issue on startup. That accounts for 100 percent of my flight events last week.

"Dear CRM director, why are you spending time selling us someone else's program?" Glad you asked.

Here's why. We believe that we can make ASAP a more effective and commonly (read: properly) used program. With the application of a few simple CRM principles, meeting the ASAP requirement shouldn't create much heartache. We also believe that, through the proper, consistent feeding of actionable data into ASAP, we can raise the quality of CRM across the fleet.

Like most of the FRSs and training commands, we believe that the greatest learning occurs during postflight debrief. We also believe that ASAP, as a mission-analysis tool, can be most effective in the decision-making process. Instead of hurriedly just fulfilling the requirement for an ASAP submission during your postflight paperwork, or worse, clicking on the "No Significant Event" macro on your desktop, conducting a solid mission debrief that includes reportable ASAP information can enhance the quality of the data generated. Because the data points are generated as the result of a thoughtful, integrated, crew-centric, mission-analysis process, the benefit to the fleet can be more substantial. Standardizing debrief items also gives your crew a voice, leads to better crew cohesion, coordination and esprit de corps.

THE ASAP NEWSLETTER, "N-Plane-View," ticks off your achievements in solving aviation-related safety problems. Make no mistake about it, they are your achievements. Through your effective communication and leadership, significant changes have been made that fill in the holes in Reason's Swiss Cheese Model and prevent possible mishaps.

However, we can do better. CRM program managers and instructors have the mandate to make this happen across all type/model/series. Adding ASAP to squadron debrief items is one way to fulfill that mandate.

There will, of course, be some missions that truly don't have any ASAP reportable items. When you find yourself at the last debrief item and the mission commander/aircraft commander is just about to close out for the day, if you've got no external reportables, think of DAMCLAS. If you can find any breakdowns in CRM during the mission, I urge you to outline them in an ASAP report. The folks at Crew Resource Management are continually combing data, looking for feedback from the fleet that will help us better serve your needs.

LCDR. O'BRIEN IS THE DIRECTOR, CREW RESOURCE MANAGEMENT (CRM), NAVAL AVIATION SCHOOLS COMMAND. THIS ARTICLE WAS ORIGINALLY PRINTED IN THE WINTER 2012 EDITION OF THE "SAFETY SIGMA," THE SCHOOL OF AVIATION SAFETY'S (SAS) QUARTERLY NEWSLETTER.

CRM

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DECISION MAKING • ASSERTIVENESS • MISSION ANALYSIS • COMMUNICATION • LEADERSHIP • ADAPTABILITY/FLEXIBILITY • SITUATIONAL AWARENESS

My Shortest Flight

BY LT. ZACHARY MILLER

Photo by MCS3 Carlos M. Vazquez II. Modified.

It was another hot, muggy September night in the North Arabian Gulf. Our MH-60R was set to launch just before midnight in low-light-illumination conditions for an armed surveillance and reconnaissance (ASR) mission in support of Operation New Dawn (OND). The aircraft was scheduled for 3,800 pounds of fuel, with a standard combat load of Hellfire missiles, AIRBOC, a M240 crew-served weapon, chaff and flares. As part of the preflight planning, performance calculations were made at max gross weight. A single-engine airspeed required 55 to 85 knots on takeoff, and would increase to 25 to 105 knots as we burned down to 1,000 pounds. With the numbers in hand, we headed to the flight deck to crew swap into the aircraft.

I climbed into the left seat before the grapes had begun fueling the aircraft. I noticed the fuel total was about 1,300 pounds; 1,200 pounds in the internal tanks and 100 pounds in the auxiliary tank. This was unusual because the fuel-management system was supposed to transfer all the fuel to the internal tanks.

As the right seat pilot started to unstrap and prepare to exit the aircraft, we started to fuel. The helicopter aircraft commander (HAC) completed his turnover with the previous HAC. As I discussed the plan of action with my HAC, I noticed that the internal tank was full and fuel had started to fill the aux tank. I immediately signalled to cut fuel, but by the time the fuel was stopped, 200 more pounds of fuel was added to the aux tank. Total fuel now consisted of 3,800 pounds internally and 300 pounds in the aux. Noting the change in fuel and weight, we conducted takeoff checks.

Before takeoff, and because of poor visibility from the bridge, tower asked us to fly five miles ahead of the carrier and search for contacts. I looked at the gauges and provided a “gauges green” call. The HAC lifted the aircraft to 10 feet. After one final check of the gauges, we proceeded with forward flight. After we had a positive rate of climb, reached safe single-

engine airspeed and verified that the stabilator was programming, I began the Post Takeoff checklist. We leveled off at 200 feet AGL and 70 knots. As I completed the Post Takeoff and Combat checklists, our aircrewman used the forward-looking infrared (FLIR) to identify the contacts in front of the carrier. The HAC began to check in with various controlling agencies. After I completed the checklists, I took control of the FLIR from the aircrewman and looked at the contacts that had not been identified.

As we headed outbound and just after we had checked in with Red Crown, we received a "No. 1 FUEL PRESS" light. This happened only seven minutes after takeoff. The HAC alerted the crew of the caution. I stared at it in disbelief and began the emergency procedure.

I called, "No. 1 fuel selector lever to cross feed." As I placed my hand on the No.1 fuel selector, the HAC and the aircrewman "rogered" concurrence.

Immediately after I placed the fuel selector in crossfeed, the No. 1 engine flamed out. The first thing I noticed was No. 2 engine turbine gas temperature (TGT) and torque indications were in the red, while all the engine indications for the No. 1 engine started to drop. The HAC already had started the "Single Engine Failure in Flight" emergency procedure, stating many of the steps in combination with a few colorful expletives.

Even with his swift reaction, the aircraft immediately started drooping (rotors slowing down) and descending — the result of the loss of an engine combined with high ambient temperatures and high gross weight. The HAC worked hard to control the aircraft as we descended to 130 feet AGL and lost five to 10 knots of airspeed. The HAC increased the airspeed back to 70 knots, which is our minimum-power-required airspeed. He also controlled the rotor droop, but could only keep the aircraft up around 130 feet in the heat and humidity.

Photo by MCS2 David Hooper. Modified.

The TGT on the No. 2 engine kept rising to its contingency-power limiter's activation point of 891 degrees, which cut fuel and caused the rotors to droop more. The HAC was forced to decrease the collective setting, allowing the TGT to go down and the rotors to speed up. He continued this back and forth action with the collective, trying to find the sweet spot.

The aircrewman called for fuel dump to help lighten the aircraft, and the HAC called for the "APU Emergency Start Procedure" to ensure that we would have electrical power if the other engine dropped off-line.

As I prepared to bring the APU on and dump fuel, the situation took a turn for the worse. As I reached for the APU start switch, my night-vision goggles (NVGs) went out. I immediately switched to the backup battery pack, but nothing happened. I checked the connections on the back of my helmet, but they looked good. I told the HAC and aircrewman that I had a tube failure.

As the HAC continued to control our extremely power-limited aircraft, I thought, "Is this really happening? I might actually be going swimming tonight."

I pushed through the tube failure as I placed my hand on the emergency fuel-dump switch. When the HAC and aircrewman rogered concurrence, I broke the shear wire and flipped the switch. Fuel started dumping; the aircrewman called out the fuel state.

I then asked the HAC, "Do you want me to push the 'All Stores Jettison?'"

He said, "No, continue dumping fuel and get the APU up," which I did immediately.

Suddenly, my NVGs reactivated. I wasn't sure why, but I was happy to have them working again.

As the aircraft got lighter from dumping fuel, it became more controllable. We started to head back to the carrier. The HAC switched back to tower and advised them of our emergency. He informed them that we would be making an emergency landing to spot 9, which is on the aft end of the deck. He also said we needed maximum winds over the deck.

I stopped dumping fuel with 1,700 pounds on the display. With the aircraft now under control, we climbed. As we headed back to the carrier, the HAC called for the "Engine Air Restart" procedure. I initiated the emergency procedure and waited for the engine to light off, but the engine wouldn't come online. I broke out the NATOPS pocket checklist to make sure that all steps of the recent emergency procedures had been executed. I reviewed the "Engine Malfunction in Flight," "Fuel Press Caution," "Engine Air Restart," and "Single Engine Failure in Flight" procedures. I then started the "Single-Engine Landing" emergency procedure.

As we approached the carrier, tower cleared us to land. We then heard our commanding officer's voice on tower's freq, "703, Rep, button 18."

The HAC told me to go up button 18 on the other radio and talk to our CO. Still shaken, I mistakenly programmed button 18 on the radio the HAC was using to talk with tower. The aircrewman reminded us that we had not informed tower yet of our intention to make a running landing. So, the HAC tried to advise tower, but unknowingly transmitted on button 18.

I tried to transfer the fuel from the aux tank to the internal tank with no success. With a NATOPS on-deck fuel limit of 600 pounds, we had now put ourselves in a limited-fuel situation.

The CO asked if we had calculated our safe single-engine numbers. The HAC responded, "Affirmative," and shared that the aircraft "starts to descend pretty well" around 55 knots.

We heard Red Crown making calls on guard frequency to another unidentified aircraft, which made it difficult to hear our CO. The CO asked if we already had dumped our fuel. The HAC said we had dumped down to about 1,700 pounds, and that we would continue to dump down to about 1,000 pounds. The skipper said they would also calculate the safe single-engine numbers to compare to ours.

The HAC had me continue dumping to 1,000 pounds. The aircrewman and HAC yelled to secure the fuel dump when they noticed we had a "No. 2 FUEL LOW" light. At 1,050 pounds on the fuel total display, I was surprised by the light. However, I realized there was also a fuel split with about 450 pounds in the left tank, 250 pounds in the right, and 300 pounds still in the aux tank for which we had not accounted.

The fuel gauge on the MH-60R displays total fuel including the aux tank, even when it is not immediately available. I tried to transfer the fuel from the aux tank to

Photo by MCS3 Walter M. Wayman. Modified.

the internal tank with no success. With a NATOPS on-deck fuel limit of 600 pounds, we had now put ourselves in a limited-fuel situation. After another call from Red Crown came over guard the HAC said, "Secure guard." I asked the aircrewman to get it while I continued to transfer fuel.

The HAC advised us that he was now making the approach to the ship. Realizing the earlier radio mistake, the HAC switched to tower and called, "703 on final."

While I continued to troubleshoot the fuel transfer, the aircrewman reminded me to back up the HAC on the approach. I rogered and started to call out altitude, airspeed and gauges. The HAC called tower to clear the landing signal enlisted (LSE) away from the landing area, and that we would be making a running landing. As we came through 100 feet, we started to approach the lower end of the single-engine window, which was 25 knots. The rotors began to droop. I advised the HAC of the condition and we increased airspeed. Tower came back and stated they could give us more winds, but we were committed at that point.

The HAC responded, "We're coming in, clear the deck!"

As we came over the deck we entered ground effect, and we reduced the descent along with airspeed. I continued to provide airspeed and altitude calls all the way to the deck. We landed with a little roll as the aircrewman and I immediately called for brakes as the HAC applied them. We rolled about five feet before we came to a stop, just 14 minutes after our initial takeoff. The aircrewman and I complimented the HAC on a great landing.

A post inspection showed that the fuel pump for the No. 1 engine had failed. The fuel lines were dry. An inspection of my NVGs revealed a faulty connection on the forward mount, which had caused the malfunction.

Reflecting on the emergency, if I had not been so focused on getting back on deck, I would have noticed that our total fuel on the display included the unusable 300 pounds in the aux tank. I would not have dumped our fuel almost all the way to our NATOPS minimum, therefore complicating our situation.

Even in the presence of a catastrophic failure or severe malfunction in the aircraft, you must remain calm and focused so you do not overlook something that could make things even worse.

LT. MILLER FLIES WITH HSM-71.

Who Needs

BY LT. DAVID TURNER

It was the second week of my nugget cruise, flying lot 16 FA-18Cs with the VFA-195 Dambusters. We were finishing our combat-operations-efficiency (COE) evaluation and conducting strike training off the Okinawa coast. The weather had been solid overcast for days, with ceilings low enough that we had been consistently flying day, Case III operations.

I launched off the boat with my CO and another JO for a strafe mission at the Okino Daito Jima island range. Surprisingly, we found a break in the weather just big enough to execute the strafe pattern. We made our runs and hung out at max endurance for 30 minutes. We returned as singles when we heard the unsurprising news that mom was Case III.

After checking into marshal, I quickly descended to my angels and started working my timing problem. I commenced, penetrated, and just after leveling off, I

Photo by PHAN Stephen W. Rowe.

Ailerons?

heard paddles come up with the words no carrier pilot wants to hear: "99, taxi lights on."

My CO then came up on our aux frequency with some sort of comforting statement like, "New guy, don't screw this up."

I flipped on my taxi lights and lowered my gear and flaps. I heard Betty (the master-caution verbal alert) say some more words that no Hornet pilot wants to hear: "Flight controls, flight controls."

The jet yawed significantly to the right before the nose came back forward. I brought up the flight-controls-systems (FCS) page and noticed both ailerons were completely X'd out, indicating they were not working. I asked approach to speak with a squadron rep and tried to break out my pocket checklist (PCL). The ILS showed that I was well left and that I already had missed the three mile push-over point. I tried to get back on the approach while simultaneously telling the rep about my issue. I was also trying to tell the landing signals officer (LSO) what was going on. Paddles smartly told me to take it around high — a decision I should have made back at five miles.

After I was established on the standard Case III downwind configuration with gear up and half flaps, the rep and I started working through my issue. He asked if I had tried an FCS reset, which of course I hadn't. The Xs cleared up and I started my second try at the approach. I turned to final, configured and aligned on the ILS. As soon as I pushed over at three miles, I heard it again, "Flight controls, flight controls."

"Paddles, 406. Clara ship. I lost the aileron again."

The jet yawed right again, and I fought to keep her on the final-approach course. I tried repeatedly to contact paddles, but having done only a handful of non-carrier-qualification (CQ) approaches, I didn't realize they rotate between two frequencies as aircraft recover. During normal operations, aircraft will either be on approach A or B, but during CQ, A is the only one used. I finally reached them at a mile.

"Paddles, 406. Clara ship. I lost the aileron again."

"Roger. Wave off, wave off."

I then received, "Signal tank." I switched to departure, climbed above the weather and found the tanker.

I had previously called the ball the first time near the aircraft's max trap weight, which for a high-lot FA-18C equates to a fuel load of about 5,500 pounds. Two passes and some troubleshooting later, I approached the bingo fuel of 3,500 pounds to Kadena Air Base, Okinawa. I found the tanker, but missed the basket the first time and the second.

"Relax brother, you got plenty of time," said a great American in the tanker. I finally plugged at 3,600 pounds of gas. I received 2,000 pounds and initiated a descent back to 1,200 feet.

AFTER TALKING TO THE REP, I got the Xs to clear. He advised me that if it happened again, paddles would take me without the ailerons. We discussed the increase in approach speed and possible degraded handling. In the approach configuration, the ailerons drop to match the trailing edge flaps, and when one fails, it is driven to a neutral position by air loads. The other aileron will then fair to match it, to provide symmetric-flying qualities. With ailerons in the faired position, NATOPS states that approach speed increases by eight knots from the full-flaps configuration. Even with two faired ailerons, sufficient roll control is provided by differential stabilators. One problem I previously had noticed was the other aileron would not fare quickly, causing an initial element of roll.

As I aligned myself on final bearing for the third time, I dropped the gear at eight miles and got an immediate flight-controls aural tone. I quickly mashed down on the FCS reset and the problem Xs cleared. At three miles, I heard it again, and quickly mashed down to reset the ailerons. This reset worked and I continued to the ball call.

The ship controller called, "406, three-quarters of a mile on and on, call the ball."

Scared pilot (me) responds, "Clara ship."

The LSO comes back with, "Paddles contact, you're on glideslope."

The visibility slightly improved. I began to discern the outline of a ship and a lens, but as soon as I called "Ball," I again heard, "Flight controls, flight controls."

The jet yawed, but this time I stomped on the rudder to keep the nose tracking straight. I settled and got a quick power call from the LSOs. As I overreacted, I got a prompt, "Easy with it." I caught the three-wire.

Later, as we watched the pass on the PLAT recording, we saw the true airspeed go from 150 to 170 knots as the ailerons visibly faired.

I learned that you should never try to continue an approach with a significant emergency. If a quick FCS reset doesn't fix the situation (assuming the PCL allows it), it's time to tell approach that you need to go-around high or request a turn to downwind for troubleshooting. Having just finished FRS CQ, I was used to involving paddles in most decisions, but in the absence of guidance, it's better to take it around immediately than to commence with a flight-control issue.

I was unaware how much the approach speed mattered with emergencies at the boat. Paddles was concerned at first that I had kept a secret about my emergency, until they realized it happened on the ball. At the time, I didn't understand wind-over-the-deck requirements, and whether you can ever take your own waveoff. Under most circumstances the answer is no, but if you have an issue which alters your configuration, in a way that paddles does not know, it is acceptable to wave off.

The final lesson relates to FCS emergencies. In the FA-18E, which I now fly, a note in the PCL under the FCS emergency section mentions, "Avoid multiple FCS reset attempts of a recurring FCS failure to preclude the failure from occurring during a critical phase of flight (e.g. during final approach to landing)" or on the ball. Check!

LT. TURNER FLIES WITH VFA-195.

BRAVO Zulu

The mission was scheduled for six hours of helicopter air-to-air refueling (HAAR) training over the Pacific Ocean. As the CH-53E crew pulled into a 10-foot hover for a routine power check on the initial takeoff, they heard an unusual sound from the No. 2 engine.

The helicopter aircraft commander (HAC), Maj. Kelly Allen, immediately saw a drop in torque, as well as a rapidly rising engine temperature for the No. 2 engine. He took the controls and called for the No. 2 engine to be secured. The copilot, Capt. Robert Golike, secured the engine and scanned the instrument panel for secondary indications. The crew chiefs, Cpl. Jason Renstrom and Cpl. Timothy Rossiter, made calls over the interphone-communication system (ICS) to help get the aircraft on deck.

While settling on the deck, the No. 2 engine fire light came on, and smoke started to fill the cabin. As an ICS call for "Fire" was made, Capt. Golike pulled the No. 2 T-handle full aft. This action released two fire-extinguisher bottles into the No. 2 engine compartment. He shut down the remaining two engines before exiting out the right crew door. Corporal Renstrom and Cpl. Rossiter had the two other aircrew exit at the rear of the aircraft. They then exited from the crew door, while remaining on ICS as the aircraft spun down.

Once the rotors had stopped, Maj. Allen exited the aircraft and accounted for all aircrew and passengers. He directed the crash fire and rescue (CFR) crews to the flames coming out of the No. 2 engine air intake. The engine fire was quickly extinguished. Only 30 minutes had elapsed from takeoff to being towed to the line for inspection.

Postflight inspection of the engine revealed a charred engine compartment and damage to the exterior of the engine.

Left to right: Cpl Jason Renstrom, Capt Robert Golike, Maj Kelly Allen.

Lt. John Gleason and his student, Ltjg. Holly Carter were practicing hover patterns at an OLF runway prior to confined area landing/landing zone training. AWR2 Tim Weldon and AWR1 William Stevens were in the cabin. Lt. Gleason had the controls on approach to a hover. Passing through 15 feet, the nose of the aircraft began an uncommanded right yaw.

After applying full left pedal, with no response, Lt. Gleason announced, "Hover, hover, hover" over ICS to initiate the loss of tail-rotor drive emergency procedure. AWR2 Weldon immediately transmitted a Mayday call, while Ltjg. Carter reached for the power control levers (PCLs). As they focused on keeping the aircraft level, the spin rate accelerated, increasing the centripetal forces on the crew. After a full rotation, Ltjg. Carter could reach only one PCL, pulling it to the OFF position. As the aircraft slowed the rate of rotation, Ltjg. Carter was able to reach and retard the second PCL.

Following an increase of collective to cushion the landing, Airwolf 400 landed with a slight right rotation. There was minimal damage to the aircraft.

From left to right: AWR2 Tim Weldon, AWR1 William Stevens, Lt. John Gleason, Ltjg. Holly Carter, Ltjg. Colin McCarthy.

More Gray Hairs

BY LT. KEN DITTIG

It was a great day in beautiful Pensacola, Fla. The weather was clear and a million, and we were scheduled for a section low-level in two T-45Cs. The lead jet had an international, student naval flight officer (SNFO) and me, and the wing included two instructors on an upgrade flight.

The event went as advertised. The student performed well on the route and during the administrative portions of the flight. Returning to Sherman field from the west, we switched to Pensacola Approach and requested the course rules.

The Naval Air Station was landing runway 01, with winds coming out of the northwest. We flew to Point Long, six miles south of the field, and turned north to set up for the overhead. As the flight switched to tower, we heard that a T-1 was cleared for takeoff on runway 01 prior to our arrival. We were six miles south of the field, with wing on the left side, set up for a right break. Tower told us to report the numbers and expect to break at the upwind numbers because of a T-45 approaching right low key. At three miles south of the field, we saw the T-1 starting his takeoff roll. As we arrived over the numbers, the T-1 started to rotate. We reported the numbers and again were told to expect the break at the upwind numbers.

Passing midfield, we were at 1,300 feet and aligned with the east taxiway to deconflict with takeoff traffic. The T-1 was past the upwind numbers and passing 700 for 3,000 feet. Normally, we would be deconflicted laterally due to us being aligned east of the runway, but a strong wind out of the northwest was rapidly pushing the T-1 in our direction.

The T-45 approaching low key made a radio call asking for clearance to land. Tower immediately replied to that call with our clearance to break but didn't respond to the low-key traffic. We didn't expect that communication in response to the other aircraft's request, and the result was that both the tower and us started getting behind the power curve. Breaking wasn't an option. We had briefed a two-second interval break, so had we broken, Dash 2 would have had a face full of

Photo by MCS2 Nathan Laird.

T-1. Instead, we opted for the simple fix of aggressively checking the flight right 30 and extended upwind.

We wanted to make sure we were on the same sheet of music as tower and requested downwind as the low-key traffic was no longer a factor. They replied by clearing us for a left break. With our abrupt check turn to the right, wing was in more of a column position instead of the parade position he had occupied approaching the field. Tower perceived the formation as set up for a left break and cleared us to the left. The problem was the T-1, which we just had a close pass, was to our left and now at our altitude. We promptly asked tower to make sure that we had heard correctly. Tower quickly corrected the call and cleared us to break right. We complied with their instructions and landed.

Upon landing, we promptly called the tower supervisor and straightened out the confusion. We listened to tapes and figured out what had happened from everyone's perspective.

The flight resulted in no injuries beyond a few more gray hairs for the T-1 and T-45 crews, but it was a good example of how numerous factors can cause an uncomfortable situation. The T-1 delaying takeoff, the strong wind out of the northwest, the low-key traffic, and the comms confusion with tower all came together. These contributing factors drove two sets of aircraft to the same piece of sky without a single ATC violation.

This example also drives home the point that although good communication is a big part of safe and effective flight ops, keeping your eyes outside the cockpit is the first part of the aviate-navigate-communicate mantra.

LT. DITTIG FLIES WITH VT-86.

ORM corner

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A night in Oman

BY LT. ALEXANDER HORN

Two months into a seven-month, surge combat deployment, we were settling back into the Operation Enduring Freedom groove. Our tired Grumman iron was limbered up after a month of sporadic flying and performing well. My crew and I launched our EA-6B on a day mission into Afghanistan, to be followed by a dark trip back to USS *John C. Stennis* (CVN 74).

The mission itself was long but uneventful. We cruised back down the boulevard, arrived right on time and got vectors for recovery. We adjusted gross weight, turned to final bearing and dirtied up at eight miles. ECMO-1 (the right frontseater) hawked our configuration indications on the integrated position indicator (IPI), while I continued to fly. Our horizontal stabilizer shifted to extended throws, as expected, allowing us to slow to approach speed. I glanced down at the IPI, ready to blaze through the landing checklist.

We had the flaps, slats, and our beefy mains extended, but the nosegear was barberpoled, giving us a black-and-white hashed indication instead of the usual nosegear silhouette.

We talked to approach and got a vector away from the recovery stack. We also asked to talk to our CATCC (carrier air traffic control center) representative, so we could deliver the bad news. We had a configuration problem and even though we were close to max trap, we still were relatively low on fuel, high on the throttles and 200 miles away from our divert field.

Our biggest concern was time — specifically, how long it might take to work through the "landing gear handle down indicates unsafe" checklist, and how much fuel (read: time) we had remaining before reaching a critical state. The four-seat Prowler necessarily teaches aircrew some of the finer points of crew resource management (CRM) through effective coordination in the cockpit and ready-room debriefs of occasional "What the hell is going on?" moments in the air.


Photo by MCS2 Justin Smelley. Modified.

The Prowler has front and back cockpit radios, and each crew station has volume controls for each radio. The workload in an emergency can be divided among the crew, or it can devolve into a black hole that devours situational awareness (SA). Our most critical challenge was to filter the information sent our way, managing the requests for information coming from the CATCC rep, approach control and the tanker. We needed to find the time to work our way through an involved checklist before burning through all our fuel.

We began by aviating and navigating to a sanctuary altitude overhead the boat. Meanwhile, ECMO-3 (a backseater) talked with our representative on the boat. He confirmed our divert distance and the dirty, bingo fuel state that our weeks of operations in the Arabian Sea had burned into our memory (and which we were already below). The boat quickly vectored a tanker to us to visually inspect our gear. It was a great move that saved us time and fuel.

We chose to talk with the tanker on the rep frequency versus the departure frequency. We wanted to provide all the decision makers sitting in CATCC a play-by-play of what was going on. Our tanker pilot gave our gear a thorough inspection as I talked to him about what he could expect to see on a fully extended nosegear. I confirmed with him that the lower strobe still was flashing, indicating that we had zero secondary indications of three down and locked. According to his description, it sounded like our nosegear had fully extended, but we didn't have the proper indications in the cockpit. It was heartening to hear that the gear appeared down, although we would still plan to the worst-case scenario: having the gear collapse on impact. With that as our jumping-off point, we pushed the tanker to a safe distance and plunged into the checklist, going through an array of yawing, loading, unloading and dutch rolling while varying speeds and configurations. Ultimately, the

wiggling and shimmying did nothing to improve our situation.

The last step of the checklist is to emergency-extend the gear. For the Prowler, this is an irreversible pneumatic operation. While we had been going through the checklist and providing periodic updates of our progress, configuration changes and fuel state to the tanker and boat, the reps in CATCC had been formulating a plan if our gear failed to come down. To our relief, the plan did not involve the word "barricade." Instead, it wisely involved tanking to a state above our dirty bingo, then attempting the emergency extension and diverting if we didn't get three down and locked.

After a few minutes of exciting gear-down, flaps-up, slow-speed tanking, we separated and brought down the flaps and slats to slow below the 150-knot, emergency gear-extension limit. I made sure we were well below the limit, grabbed the landing-gear handle, pushed in, twisted and yanked back hard. We heard the bottles blow, but the barberpoled nosegear continued to mock us. I told the crew that it hadn't worked and tried a few more actuations per NATOPS, all to no avail. We then turned and began our dirty bingo profile to Masirah Island, Oman.

WE HAD TO FIND OUR WAY to an unfamiliar field at night for a visual approach and unconventional landing. The boat fed us a couple frequencies for Muscat ATC, and ECMO-1 contacted our new best friends. A weak radio transmitter and significant language barrier conspired against us as we tried to convey our desire to have Masirah rig their arresting gear. Eventually, we discovered that "cable" was the magic word we were looking for. Without any approach plates for Masirah, we studied the only thing we had, the airfield diagram, and focused on the position of the arresting gear. With the nosegear still barberpoled, we read through the notes in the landing-gear emergency guide.

We discussed our plan to conduct a flared landing and hold the nose off the runway until we caught the short-field gear. If we missed the gear, we'd hold the nose off as long as possible and hope to catch the long-field gear (a touch-and-go in the event of a failed trap was not recommended).

As we descended, I mentally ran through the landing a couple times before turning my attention to locating the runway. We had received an ILS frequency from Masirah Approach, but the ILS provided no indications. This left us with the airfield coordinates, TACAN DME and a visual approach. As I lowered the flaps and slats and maneuvered to set us up for a three-mile straight-in, ECMO-1 requested confirmation from tower that the short-field gear had been rigged. They replied that runway 17's approach-end gear was derigged and the overrun gear was rigged. We had neglected to consider the possibility that sane people, unlike naval aviators, don't consider stopping 20 tons of metal traveling at 130 knots with a 50-pound hook as a sound emergency-landing plan.

Even though I had looked at the field diagram and seen only short- and long-field gear depictions, the phrase "overrun gear" had me thinking we might not have the option of taking a trap on any runway, so I kept the approach coming. Meanwhile the ECMOs sorted out the runway configuration issues and confirmed that the overrun gear tower had referred to was indeed runway 35's short-field gear. We maneuvered to that runway.

In an effort to avoid noise-abatement procedures at Masirah, I set up for a downwind away from the populated part of the island and, horror of horrors, began a right hand approach turn. High, overshooting start — nice. As the stick monkey, I needed to start banging the cymbals a little better. The PAPI was not showing all red, so I was confident we were not going to hit a palm tree on short final. I now turned my attention to the runway itself. I looked for arresting-gear signage, but all I could see was the runway end identifier lights, two lines of white side lights (land between the lines) and the blue taxiway lights. Using the rough ground gouge I had figured out from the airfield diagram, I estimated the position of the arresting gear. I began to work on the flared landing, which was harder than I had expected because of the hazy darkness, surprising lack of ground rush and no taxi light.

With ground-effect threatening to send us past the wire, I eased back the stick momentarily to increase the descent rate. I reset the proper attitude, touched down, held the nose up and a split second later felt the welcome deceleration of a successful arrestment. The nosegear did not collapse as it slammed down.

Our biggest difficulty remaining was to extricate ourselves from the cable. While the emergency responders did not actually know how to get us out of the cable

("Nobody ever uses this," said one Omani), they were eager to help us. With ECMO-3 on the tarmac ensuring everybody stayed clear of our intakes and exhaust, three stout Omanis actually got underneath the hook and managed to lift it with their backs, while a couple more removed the cable. While I would hate to admit it to our ascot-wearing cousins in the Air Force, the Navy does not have a complete monopoly on white-knuckle night traps.

The adage, "Learn from the mistakes of others; you don't have time to make them all yourself," is embedded in the culture of naval aviation. The conduct of this particular flight was heavily influenced by a landing-gear emergency divert we had seen in our squadron during the previous deployment, by my previous experience with an unsafe gear indication, and the ensuing communication challenges.

What did those previous mistakes help us do right this time? We had seen the dangers of waffling on the decision to bingo or continue to troubleshoot in hopes of recovering aboard the boat. Our CATCC rep did a great job of realizing that an irreversible action/decision point was coming up at the end of the emergency checklist. He drove the discussion so that the decision (to refuel above a dirty bingo state, do a quick emergency-gear blowdown and bingo if it failed) was made early in the process. This ensured we immediately could transition to a bingo profile. Even a couple hundred extra pounds of JP-5 came in handy when we had to break off our initial approach and circle to land on the opposite runway.

The decision to use the rep frequency to talk to our tanker and simulcast some of our actions to the leadership in CATCC helped keep everyone informed without requiring extra communication. Even with the tanker flying right off our wing, every minute airborne was effectively doubled because we were both burning fuel, requiring us to take more gas and reducing the tanker's total give.

The divert into Masirah also demonstrated the inherent danger of dealing with nonstandard situations. We rely on standard procedures and muscle memory for large portions of every flight. Setting good habit patterns can help you on a daily basis. However, when emergency situations arise, even hitting all of the checklist items can leave you behind the power curve as your tired mind struggles to think critically and adapt to changing situations.

I knew I was not used to descending at low speeds with the gear down (190 knots for the wings clean-bingo descent, when our no flap/no slat landing procedure calls for us to remain above 200 knots until established on final). I was concerned that the high power setting and drag would provide an illusion of dirty wings, and lull me into a false sense of security, when I actually was in a flight regime closer to departure from controlled flight. I recognized this danger early and continuously reminded myself that I needed to dirty the wings before any major maneuvering.

THE OTHER PROBLEM with the unusual descent profile was that the Prowler's radar altimeter uses a continuous tone when the hydraulic system is isolated (usually with gear up) and a momentary tone when the system is de-isolated (generally, with gear down). We got our good tone at 5,000 feet as usual, but as I was anxiously trying to take advantage of our rapidly dwindling altitude to spot the runway, I forgot to reset the radalt because the tone did not continue to sound. So, we flew around an unfamiliar field at night with none of the protection offered by an approach procedure and no radalt tone to back us up.

I didn't realize I had missed an important safety measure until an "aha" moment the next morning. Finally, I cut it a bit close with the trap. Most of the gear-malfunction emergencies I have dealt with in the simulator have driven me to a fly-in engagement. Despite ECMO-1 reading the note about a desired roll-in engagement, I had set myself up mentally for a touchdown point close to the arresting gear. I even studied the airfield diagram to determine exactly where the gear was, when in reality I only needed to land near the approach end and pop a wheelie until we caught the wire.

While we're on the topic of learning from the mistakes of others, I found out later that I had unwisely succumbed to the allure of a gorgeous Prowler photo in the September-October issue of *Approach* magazine and had missed a great story about my fellow "fat kids." Their journey to Masirah in an E-2C Hawkeye had issues that mirrored many of our own. Take advantage of everyone's experience. Don't just learn about the newest way your aircraft is plotting to kill you.

LT. HORN FLIES WITH VAQ-133.

Three Down and Cocked?

BY LCDR. ROBERT EASTMAN III

Over the past few years, the EA-6B community has seen an increase in landing-gear issues. "Tired iron" has become a bit of a catch phrase, and the community has gone to great lengths to combat, correct and reduce these malfunctions. Still, despite all the great efforts by Commander, Electronic Attack Wing, U.S. Pacific Fleet, Fleet Support Team, Naval Air Technical Data and Engineering Service Command and the fleet, landing-gear malfunctions continue to occur.

Photo by PH2 Miguel A. Contreras.

We as Prowler aircrew have learned through Approach articles, all-officer meetings, safety-investigation reports and hazard reports what to do during various gear-related emergencies. Through my 10 years of flying the mighty Prowler, I thought I had seen (or heard) it all; now, I'm almost positive I have. Most landing-gear issues in the Prowler conclude with a joyous "Three down-and-locked" call by the pilot and an uneventful landing. Key word is "most."

We were in the third month of deployment to the Fifth Fleet area of responsibility (AOR), operating smoothly despite the crushing heat and humidity of the region. Our crew included a nugget pilot, two cruise-experienced lieutenants and me, the maintenance officer. We were scheduled for a day, 1+30 unit-level-training flight in the Central Arabian Gulf. We were working virtual blue-water ops, using tank states versus bingo states.

Our brief for the sortie included a glance at the divert fields that were briefed by the carrier intelligence center (CVIC). We noted that only our primary divert field had arresting gear. This was the first time our crew had operated inside the Gulf this deployment and the first time my three other crewmates had ever flown that far north. The brief, preflight, man-up and taxi were unremarkable. It was an above average day to be flying.

After we launched, the pilot raised the landing-gear handle and we were on our way. The port mainmount

and nose landing gear came up-and-locked and indicated so on the integrated position indicator (IPI), but the starboard landing gear indicated a barber pole in the IPI window. In addition to the barber pole, secondary indications supported that our gear was not up-and-locked: landing-gear transition light-ON, angle-of-attack (AOA) indexers-OFF, lower anti-collision light (later confirmed)-OUT.

ECMO 1 (right front seat) could see what looked like the starboard forward gear door was still open. He could also see the starboard landing-gear tire in his mirror. Nothing was noted on the port side. We began to climb overhead and coordinated with tower to have a visual inspection of the landing gear. As we climbed, we started the checklist for unsafe gear up. The yo-yo recovery tanker was tasked to take a look at us and joined us overhead the carrier. The tanker crew confirmed that the starboard landing gear was not up-and-locked and both starboard gear doors were open.

They also said the tire appeared to be jammed or lodged against the fuselage. The tire and wheel were both intact, but appeared to have started their rotation for stowage. After consulting with the tower representative, we decided to lower the landing gear using the normal method. The handle moved and the port and nose landing-gear windows showed barber poles.

Within the nine seconds allotted by NATOPS, all three gear showed down-and-locked with good secondary indications: negative transition light and positive AOA indexers. At that moment, it appeared our emergency was complete, and all we had to do was land aboard the ship — piece of cake. We asked the tanker to confirm we had three down-and-locked, just for the warm and fuzzy.

All we heard at first over the radio was "Ummm…."

"Well, this can't be good," I thought.

The tanker crew then confirmed that the gear appeared normal with one exception. They said the starboard landing gear appeared down, but the starboard wheel was cocked outboard at about 60 degrees, meaning the leading edge of the tire was pointed 60 degrees relative to the aircraft's longitudinal axis.

I was right, this wasn't good. We had no emergency procedure (EP) for "Cocked mainmount," and I hadn't ever heard of such a thing. We reported what we had over button 18. There was an uncomfortable pause, followed by the rep saying, "Copy." He also knew it wasn't good.

We looked at our fuel state and discussed options. We thought that raising the gear probably was not going to help the situation and may actually make it worse. We calculated a dirty bingo to our divert field and verified our calculation with other rep. I also asked him about the status of our divert fields and the status of their arresting gear.

His response was, "They're good-to-go. Standby for the plan." I knew he was lying, but I later thanked him for not adding any additional emotions into our cockpit.

There was a dust storm at the field with arresting gear, and the visibility was well below optimal. Though the water in the Gulf is far from blue, it looked like mother was the only viable option. In the meantime, we air refueled (AR) to keep our options open, and continued to search our PCL for a procedure that came close to what we had. After more discussions with the rep, we settled on, "blown-tire, damaged wheel," even though we had good rubber on all wheels. This proce-

dure states to leave the gear down and recommended an arrested landing — perfect.

By this time, all the "heavies" were in the tower to help our rep help us. The option to divert was discussed, and though the visibility was currently poor, it was forecasted to get better, so we could continue to AR until the visibility improved. After some solid TCRM by the captain, CAG, CAG paddles and our skipper, it was decided that our best course of action would be an arrested landing aboard mother. The driving force behind this was the pay-out of CVN arresting gear versus field gear. The concern was that if we trapped at the field, the pay-out may be long enough that the starboard tire could cause a large right drift, fail and result in our aircraft leaving the prepared surface.

In our current configuration, we had three down-and-locked and good rubber on all of our landing gear. For all intents and purposes the aircraft flew normally, and we expected to touchdown and trap. We surmised that with a shorter wire pay-out the aircraft would not drift right as much as with a field arrestment. It was also discussed on the ship, but not shared with us, that we were going to get two shots at this. If for whatever reason we didn't get aboard after two, we would be going to the beach. We topped off our fuselage tanks to be max-trap on the ball and to give us a couple of looks before we had to bingo. The rest of the air wing had recovered, including the tanker. This action eliminated the possibility of diverting another aircraft should we foul the landing area with pieces of our tire or aircraft.

WE WERE TOLD TO SET UP for a straight-in, expecting the waveoff for a low approach, so that everyone could get a look at what we had. After two low approaches, the pilot set up for our final straight-in. CAG paddles told our pilot to fly a normal pass to reemphasize that all would be OK. Our pilot flew a normal approach for the arrested landing.

On landing rollout, the cocked starboard main remained in relatively the same position throughout the arresting-gear pay-out. At the end of the pay-out, the starboard wheel castered clockwise. It came to rest with the starboard wheel inboard of the starboard strut. The aircraft was chocked and chained in the landing area and shut down. Both tires remained intact throughout the landing.

An engineering investigation (EI) was completed on the failed strut. It had failed internally due to a low hydraulic fluid level. Low hydraulic fluid leads to increased impact loads on internal components, starting with the thrust bearing and the follower. Once the thrust bearing failed, the bearing race pieces and individual bearings effectively became FOD inside the strut. During subsequent strut cycles, the internal damage continued until piston binding caused the shrink mechanism components and the apex pin to fail. The apex pin most likely failed (pulled apart in tension) on the final gear extension. With the apex pin broken, the piston and associated wheel were free to rotate uncontrollably.

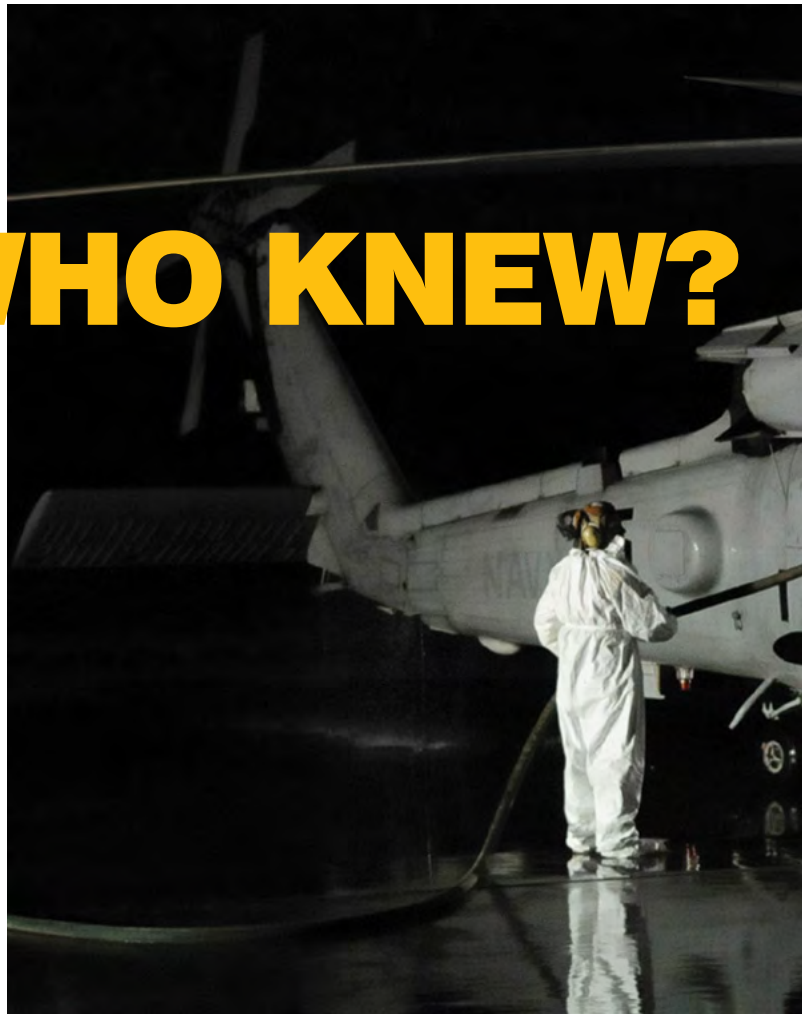
NATOPS "provides the best available operating instructions for most circumstances, but no manual is a substitute for sound judgment. Operational necessity may require modification of the procedures contained herein." This was not the first emergency that was not covered specifically by NATOPS. It won't be the last.

I later learned of the CRM that had occurred aboard mother. First, the divert weather. The rep told us the weather was fine, but we were going to try and recover aboard the ship. If he had told us the weather was bad, it would have added to our already nervous guts. Second, two chances and then divert. This information was not needed by our crew at the time, nor would it have been helpful from a nerves perspective. Third, as we were making our last orbit overhead, watching the tanker recover, I noticed that the flight deck was stacked differently. There were no aircraft parked in the six-pack or anywhere near the starboard foul line.

The aircraft was taken to the hangar bay and examined by our squadron technical experts, NATEC and FST engineers. The strut was replaced and the aircraft was returned to full flight status in minimal time.

LCDR. EASTMAN FLIES WITH VAQ 140.

Engines Need Air? WHO KNEW?



BY LTJG. JESS PHENNING

The first week of our helo detachment's work-up was done, and we felt more comfortable operating on the ship. We'd been on Alert 30 all day. As the day wore on it seemed less and less likely that we would be called up. Shortly after 8 p.m., we got the word to stand down.

Our detachment maintenance officer said I would have to do a water wash before we brought the helicopter inside. A change in recovery times the day before had necessitated bringing the bird in the hangar quickly after it was shut down, which had precluded the standard end-of-day water wash.

"No problem," I told him. Ah, the water wash, so easy that a pilot qualified in model (PQM) can do it.

I grabbed my gear and helmet and walked to the flight deck. I shined my flashlight down the sides of the helicopter and saw the high points, tail tiedowns, external power, and datalink hardware still attached and connected. While the maintainers were removing those things, I opened the pilot's side door and shined my light on the rotor-brake pressure gauge to verify at least 450 psi. I got out, closed the door, walked around to the ATO side and strapped in. One of the detachment mechs attached the water-wash connector, and we were ready to go.

I ran through the standard wash with no issues. The mech disconnected the water-wash equipment. I continued with the checklist for the dry-out, which involves running the engines at idle for six minutes. I cleared left and right, and then started engine No. 2. I noticed the engine was a little hotter than normal, so I hawked the gauge to make sure it didn't reach the 851 C limit before idle was attained. It didn't and TGT peaked — granted, still hotter than normal. It appeared steady, so I continued and started No. 1. It was also hotter than normal but still within limits. I got to idle speed with No. 1 and noticed No. 2 TGT was creeping upwards, passing 810 C and entering the 30-minute limit.

Although No. 1 had peaked during the start, it also was creeping upwards; something wasn't right. I shut down both engines and signaled the plane captain to send over the mech. The maintainer walked up to the bird, and I opened the door to tell him I had shut down the engines because they were running hot. Before he got to the cockpit, however, he looked up and bolted past my door to No. 1. To my horror, he walked back around the nose of the aircraft with a red intake cover. He retrieved its twin from No. 2. They'd been installed earlier in the day after the aircraft had been spotted for takeoff to keep salt spray out of the engines. I was glad that they were the only covers installed, and that I had

Photo by MCS2 Devon Dow. Modified.

shut off the engines before any limits were exceeded.

I TOOK A DEEP BREATH and finished shutting down the aircraft, going slowly and carefully through the remainder of the checklist. I got out of the cockpit, and the maintainers that had been on deck came up to me. The plane captain, the mech and I were mortified. We had all missed something very basic that could have done a lot of damage and hurt someone.

"Well, ma'am, this is a little bit on all of us, right?" said one of the maintainers.

Yes and no. Yes, because safety is an integral part of our lives, especially in this business, and we have to keep our heads on a swivel for everyone's sake. Before I got to the aircraft, it was the job of those on the flight deck to make sure the aircraft was ready for what we were about to do. But no, and ultimately no, because the moment I sat down in the seat and began the checklist, the responsibility was squarely on me. The aircraft should be ready, yes, but I am the final check. When I sit down in front of the controls, I accept responsibility for verifying that the aircraft is ready for what I am about to do. I felt like a moron.

I went in the hangar and told the detachment maintenance officer what I'd done, and the mech told our maintenance chief. I had an irrational, vivid, awful thought of being the first naval aviator FNAEBd for a water wash during my walk of shame to the Boss's stateroom to tell him.

I learned a very valuable lesson about taking more time to think about a slightly nonstandard evolution, however minor. We water wash every day that we fly, but it usually takes place immediately or shortly after flight when intake covers wouldn't yet be in place. Also, I had been away from the aircraft for a while, which should have signaled to me that a complete walk-around was in order. Our detachment got a relatively benign complacency check, and I likely earned a callsign.

LTJG. PHENNING FLIES WITH HSL-48.

An Inopportune Time

BY LT. PHILLIP JENKINS

Our squadron was four months through a deployment to Kadena AB, which is on the island of Okinawa, Japan. My squadronmates and I had grown familiar with flying operational missions and training flights in the AOR and had settled into a routine. I was gearing up to complete the instructor-under-training (IUT) syllabus to qualify as an instructor pilot in the P-3C Orion.

One of the most strenuous flights in the syllabus is the IUT ride. The program is built to prepare you to not only handle a multi-piloted aircraft completely by yourself, but to do so while your "student" is doing everything to make this almost impossible. The IUT pilot sets up various scenarios for an instructor, who mimics the role of a less-than-ideal upgrading pilot. My instructor for my IUT check warm-up flight was emulating Ltjg. "Rico" Suave, a hard-partying, low-performing, upgrading copilot who seemed more focused on getting wild at the O Club than performing a two-engine landing.

I was setting up to have my student perform a full-stop landing to complete the pre-checkride warm-up flight when Rico said that he needed an extra landing for monthly proficiency requirements. I contacted tower and requested a touch-and-go followed by a full-stop, knowing that Kadena AB was about to begin quiet hours for a change-of-command ceremony. Tower

granted my request and said to taxi back to my spot after the full stop.

Following the touch-and-go, tower notified me that I would be unable to taxi to my spot for the next hour because the field had closed and quiet hours had commenced. With fuel running low, we taxied to the transient ramp (on the opposite side of the airfield), shut down, set the parking brake and turned off the hydraulic pumps.

The next series of events, while terrifying at the time, might have been the funniest scenario I've ever encountered in a P-3.

I observed that the pressure of the brake accumulator had noticeably dropped. Because "scan items" are a large part of these IUT events, I thought this indication might be part of the scenario. Also, during the previous four hours, an instructor pilot and two instructor flight engineers (FEs) had been pulling countless circuit breakers trying to distract me. I called out the low pressure and checked to see if a circuit breaker was out. I soon realized from the genuine surprise on my instructor's face that this malfunction was not simulated. He was no longer playing the role of Rico.

He told me to activate a hydraulic pump, which restored the accumulator. However, when I secured power to the pump, we observed that No. 1 hydraulic-system quantity had dropped by a gallon. The FEs hurriedly got off the plane to check for a brake leak. As we monitored the hydraulic indications, we felt the aircraft start to roll backwards on the ramp. Because our crew intended to recover at our ramp, we had no chocks onboard, and there were no ground personnel or equipment to secure our aircraft. The plane's brakes weren't working. We had been sitting on a sloped portion of the transient line, and now we were rolling toward a drainage ditch.

Outside, our FEs were getting angry because they didn't know why we kept turning on the pump and giving them a shower.

My instructor told me to quickly turn on the hydraulic pump, while he reapplied the parking brake to stop the aircraft. I did so. Outside, the FEs were jumping up and down to get our attention. They wanted us to secure the pumps because hydraulic fluid was spraying everywhere from the starboard mainmount. We secured the pump. The aircraft began to roll backwards again.

Outside, our FEs were getting angry because they didn't know why we kept turning on the pump and giving them a shower. I called ground and requested they send someone with chocks because our aircraft was losing hydraulics. We were in a Catch-*22*: We couldn't keep the airplane still without turning on our hydraulic pumps, but every time we did, we sprayed precious hydraulic fluid onto the deck. The hydraulic quantity was dropping rapidly. When we lost the last of our hydraulic fluid, the aircraft wouldn't be able to stop, and this multi-million-dollar mission bird would go off the ramp and down an embankment.

My instructor called ground and said, "We need these chocks with a quickness."

GROUND SUPPORT ROLLED TO THE RESCUE as we lost the final drops of hydraulic fluid from the reservoir. With the airplane chocked, we got off the airplane to see what looked like a murder scene around the starboard mainmount. The brake line had blown above the brake fuses, which are designed to sense a leak and keep the entire system quantity from leaking out onto the pavement.

I learned some valuable lessons as our aircraft rolled toward disaster. Even when flying a routine training mission at a familiar field, situations will present themselves that require an aircrew to change their plan. Adaptability and flexibility are critical parts of our crew resource management (CRM) toolbox. In an aging aircraft such as the Orion, malfunctions will manifest themselves at the most inopportune time. Don't let your guard down until the aircraft is chocked, chained and the mission is debriefed.

LT. JENKINS FLIES WITH VP-16.

I Don't Need No Stinkin' Pills

BY AWFC STEVEN WEBB

We were on a detachment at Sigonella, Sicily, in the middle of summer. What could be better? It was the last detachment of the year for the Sunseekers of VR-58, a C-40A squadron out of Jacksonville, Fla. We enjoyed warm days, beautiful beaches, lots of grilled food and camaraderie.

Our operations department had a five-day mission for a logistics mission to Nigeria. The mission involved a brief stop overnight in Rota, Spain, to load, followed by the cargo drop off in Nigeria. The crew would then continue to Accra, Ghana, spending the next four days until the outbound lift required pick-up.

The Det OinC and the aircraft commander knew that Ghana was a high-risk area for malaria, so everyone got a 30-day supply of the antimalaria medicine, doxycycline (aka doxy). We had heard horror stories about doxy's side effects.

Upon arrival in Ghana the crew was taken to a hotel, but the rooms were spotty at best, and the crew was told by hotel security not to leave the compound for their own safety. The only dining option for evening meals was an open-air café, which exposed the crews to the malaria risk posed by the mosquitoes. They stayed only one night at that hotel. The following day they relocated to another hotel because of water issues and lack of air conditioning in a couple of the rooms. Again, they were advised to take health precautions, continue with the malaria meds, consider remaining inside after dusk, reduce bare skin exposure by wearing long pants and long sleeves, drink bottled water and avoid consuming drinks with ice cubes.

When the time came to head back on the fourth day of the trip, four people had intestinal discomfort, and one of them was vomiting. When the aircraft arrived back in Sigonella, several of the aircrew and maintainers were immediately sent to medical. One of the pilots was med down for the remainder of the detachment from a respiratory infection. He also had a crippling ear infection. Nine days after leaving Ghana, one of the maintainers started to have minor headaches and feel lethargic. The symptoms intensified the next day with the onset of a fever. He thought it was just a common cold, so he took aspirin, slept and did not seek further medical attention.

A day later the detachment returned to NAS Jacksonville on a C-40. During the 16-hour trip, he felt an increase in pain symptoms and fever, but no other indications of a serious illness. When he got home, he was convinced his illness was the result of a common cold or flu, so he slept for 10 hours. He felt worse the next morning. He had dark colored urine, a migraine-like headache, blue-colored vision, muscle spasms in his neck and head, a body temperature of 104 F, and an extremely high heart rate. He sought medical attention at the NAS Jacksonville Hospital.

He mentioned his trip through Africa to the physician. The doctor then proceeded with a spinal tap. The laboratory results returned positive for malaria, and he was admitted to the intensive-care unit for six days. All his symptoms continued to increase, with the fever reaching 105 F. He also had the onset of jaundice from liver failure. He spent six days in the hospital, missed 11 days of work, and was on light/limited duty for two weeks.

The maintainer admitted he had not taken the medications before the mission's scheduled departure because he was afraid of the side effects. He could not recollect when he had been bitten by a mosquito, but remembers mosquitoes in Ghana. The truth is, doxy affects everyone differently, so you will not know how it affects you until you take it. I had no side effects.

I'm sure the maintainer who did not heed the warnings and had skipped the dosage would have rather dealt with the short stint of side effects rather than spend several days at Naval Hospital Jacksonville and the diagnosis of malaria, E. coli, jaundice and a near shutdown of his liver. He recovered and soon returned to duty.

AWFC WEBB FLIES WITH VR-58.

WE CAN ILL AFFORD TO ADD THE ELEMENT OF HUMAN ERROR TO THE CAUSAL FACTORS OF HYPOXIC INCIDENTS.

Key West Bliss

BY LCDR. JAMES L. FUEMMELER

It was two weeks into a fighter/weapons tactics detachment to Key West. It was well into the summer months, with oppressive heat and sweltering humidity. Not only did I fly every day, but I also was the officer-in-charge (OinC) for the det. This meant I kept busy briefing, flying and debriefing, and I also had to juggle all the maintenance, administration and operations issues for more than 40 officers and 100 maintainers. The detachment was tasked with about 250 sorties to qualify instructors and train students in Growler air-to-air tactics. This was my sixth trip to Key West on a training detachment, and the complacency of flying out of the air station had fully set in.

My flight was a section of EA-18Gs. We had an instructor pilot in the lead jet crewed with a student NFO. I was the instructor in the backseat of the wing jet crewed with a student pilot. We were scheduled for a 2 v 1 with an F-5 from the aggressor squadron acting as the bandit. It was the third wave of launches for the squadron that day. The brief, takeoff and transit to the area were uneventful. The working area was about 60 miles northwest of the airfield, and the two Growlers were going to travel to the far west portion. The F-5 would launch later and meet the two Growlers in the area.

Our section entered the area at 20,000 feet, and we realized the cloud layers could be a problem. We completed a weather reconnaissance of the airspace and concluded the conditions weren't good enough to continue with the event. I removed my oxygen mask to wipe my face clean of sweat and to drink water. As the OinC, I assumed we had lost the event and immediately began thinking of the flight-schedule rewrite.

The F-5, who was still on-deck troubleshooting some issues, obtained airspace to the southeast of the airfield for our event. This solved my problems as OinC, and we agreed immediately to the airspace change. The section climbed to 40,000 feet to conserve fuel. We transited to the new airspace southeast of the airfield and the rendezvous with the bandit.

During the transit I got fixated on the many colors of the ocean below us. I remember thinking what a great mood I was in and how great it was that the event would be completed. I was ecstatic, and I'm not usually a giddy kind of person. All of a sudden I realized that my pilot had spoken to me, and I was very slow to respond. At that moment, deep in my brain, a light went off. I remembered that my sudden euphoria, followed by slow mental capabilities, was exactly how I had reacted to the hypoxia training during my last physiology training. I put on my mask, took a couple of deep breaths and immediately felt better.

The heat, high-operating tempo and complacency were all factors in my self-induced hypoxia. The change in the flight plan from the preflight brief was enough of a distraction for me to disregard the general NATOPS instruction for tactical jets to use oxygen from takeoff to landing. I was at a cabin pressure of 15,000 feet for a few minutes, and I easily could have slipped into an unconscious state.

This was an example where "experienced" does not equal "safe." I let my opinion that I was old hat as far as flying in Key West was concerned, combined with not leaving desk work in the office, lead me being off my oxygen. Aircrew, embrace your physiology training and keep that mask on.

LCDR. FUEMMELER FLIES WITH VAQ-135. HE WAS ASSIGNED TO VAQ-129 AT THE TIME OF THIS EVENT.

Crushed My Day

BY LT. WILLIAM CAREY

It was a great day for carrier qualifications (CQ) onboard USS *Harry S Truman* (CVN 75). We had been conducting flight-deck certification, and it was finally my turn for a day CQ.

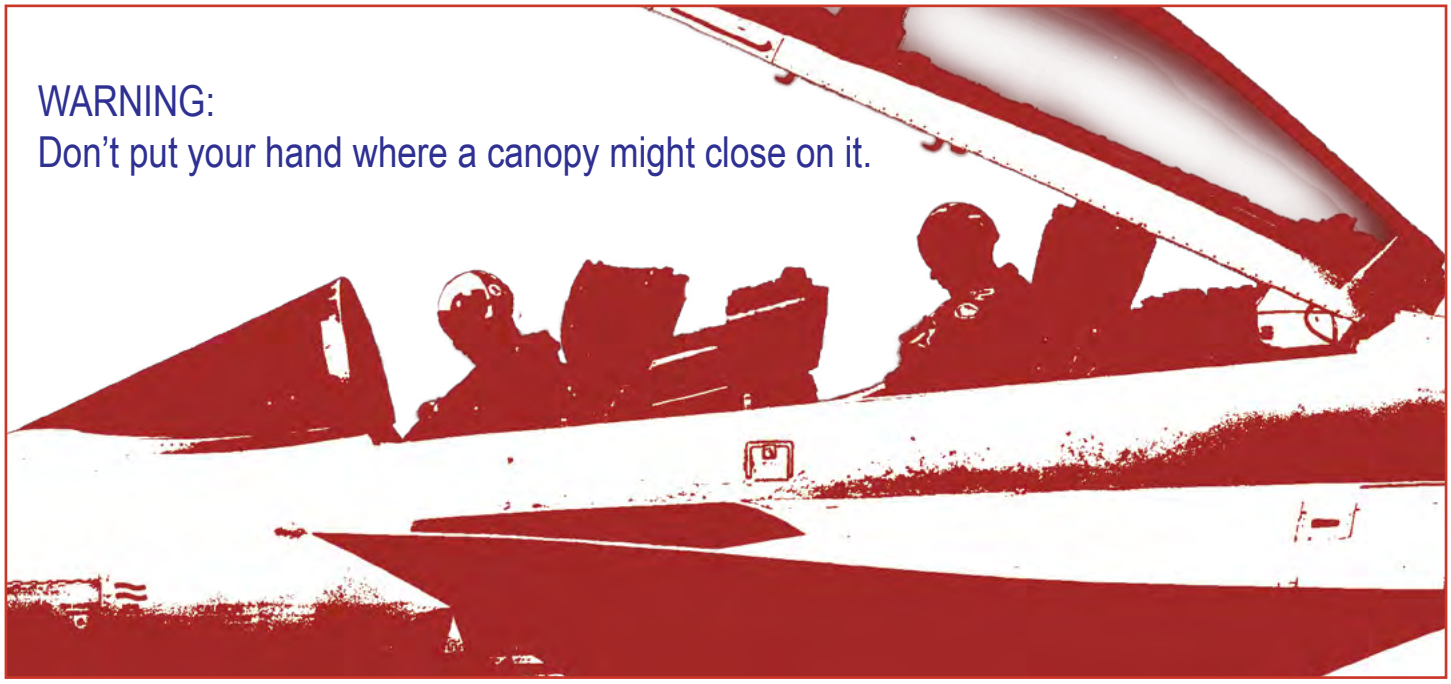
After we were briefed by the squadron LSO, my WSO and I had a five-minute crew brief to discuss specific procedures and techniques. All the pertinent items were covered, and I felt we were well prepared. The plan was for us to hot-seat after the other crew completed their CQ. The aircraft discrepancy book said the optimized-organizational maintenance activity (OOMA) was down, so we planned to sign the A sheet topside during the hot-seat procedure.

We put on our gear, walked up to flight-deck control and went to the flight deck to hot-seat. The aircraft was parked on elevator 1, the closest parked aircraft behind the JBD for cat 1. The off-going WSO got out of the jet and gave my WSO a thumbs-up to indicate that the jet was up, and my WSO climbed the ladder to get strapped in. As soon as he sat in the seat an aircraft went into tension on cat 1 and came up on power.

The maintainers gave the close-the-canopy hand signal to indicate the canopy needed to be closed ASAP to avoid damage from the jet blast coming from cat 1. It is squadron SOP that the canopy be controlled from the aft cockpit, so my WSO gave the off-going pilot the "canopy" call. The pilot called "cleared," and the canopy was brought down.

After the aircraft on cat 1 was launched, my WSO received clearance to open the canopy and the off-going pilot hopped out of the jet. When the off-going pilot climbed down, I received a quick brief on the flight deck. As I climbed the ladder another jet went into tension. Once again everyone standing outside gave the close-the-canopy hand signal. As soon as I got into the aircraft and hooked up the ICS, my WSO told me that he was bringing the canopy down. I rogered the call, and he brought down the canopy.

Once the aircraft on cat 1 had been launched, a maintainer climbed the ladder to hand me the A sheet. My WSO told me that he was only going to crack the canopy enough for me to get the A sheet,



so we could avoid having to open the canopy all the way again. The canopy was opened about six inches and the maintainer handed me the A sheet. My WSO watched as I pulled the paperwork into the cockpit. Another aircraft went into full power on cat 1, and again, the maintainers started to give the close-the-canopy signal. I did not see the signals because I was heads-down in the cockpit signing the A sheet, and the jet noise washed out our ICS.

My WSO yelled over the ICS that he was bringing the canopy back down, thinking that I still had the A sheet in the cockpit and was signing it. My WSO assumed that I had heard him make the canopy call, and he also assumed I had seen the maintainers giving us the close-canopy signal. When I completed signing the A sheet, I turned and saw a maintainer standing on the ladder. As I was passing the A sheet through the six-inch gap, I saw the canopy move. I tried to pull my arm back into the cockpit. My WSO brought the canopy all the way down and immediately saw me hit the canopy with my right hand while the maintainer, who was still on our LEX, started making an unrecognized hand gesture. Without taking his finger off the switch, my WSO immediately raised the canopy. He asked if I was OK, but I did not respond.

The aircraft on cat 1 was shot off and the jet noise subsided. I was finally able to respond that I thought my hand was broken. My WSO realized that he had closed the canopy on my hand. We signaled to the maintainers that I needed to get out of the jet. I left the cockpit with the right engine still running. Once I got out, another jet went into power on cat 1, and my WSO again closed the canopy completely. After the jet launched, he opened the canopy. A maintainer climbed up the ladder to shut off the right engine and secured the jet.

The canopy had closed on my left hand and fractured my middle finger, with a possible fracture to my ring finger. The medical folks had to reset my middle finger and put my arm in a cast. I was med down for six weeks.

FA-18E/F NATOPS sets a 60-knot restriction on an open canopy and states that taxiing with the canopy at an intermediate position can result in canopy attach-point damage and failure. It also states not to open or close the canopy with the aircraft in motion. NATOPS, however, does not specify having the canopy cracked six inches while executing a hot-seat evolution. Flight/Hangar Deck NATOPS states that the controlling plane director shall ensure that aircraft with wings folded or a canopy open are not spotted, towed or taxied immediately behind a JBD when another aircraft is at a high-power setting on the catapult. In this case, the plane director should not have spotted the aircraft, with aircrew performing a hot-seat, directly behind the JBD on cat 1 while flight operations were ongoing. Also, both aircrew violated NATOPS by having the canopy opened while spotted behind a JBD with an aircraft at high power.

This was an easily avoidable accident that was caused by a lack of adherence to the canopy procedure delineated in the squadron SOP. The SOP states that the WSO will move the canopy only after calling "canopy" on the ICS and receiving a "clear" call from the pilot. This procedure is used to open and close the canopy. A verbal confirmation that the pilot knows the canopy is about to move and he is completely clear is a requirement before the WSO can move the canopy. This is one of our most basic procedures. All other distractions (the noise and hand signals from maintainers) should not have prevented this procedure from taking place before moving the canopy.

LT. CAREY FLIES WITH VFA-32.

I AM THE FINAL CHECK.
WHEN I SIT DOWN IN FRONT
OF THE CONTROLS,
I ACCEPT THE RESPONSIBILITY FOR VERIFYING
THAT THE AIRCRAFT IS READY
FOR WHAT I AM ABOUT TO DO.

Ltjg. Jess Phenning, HSL-48