THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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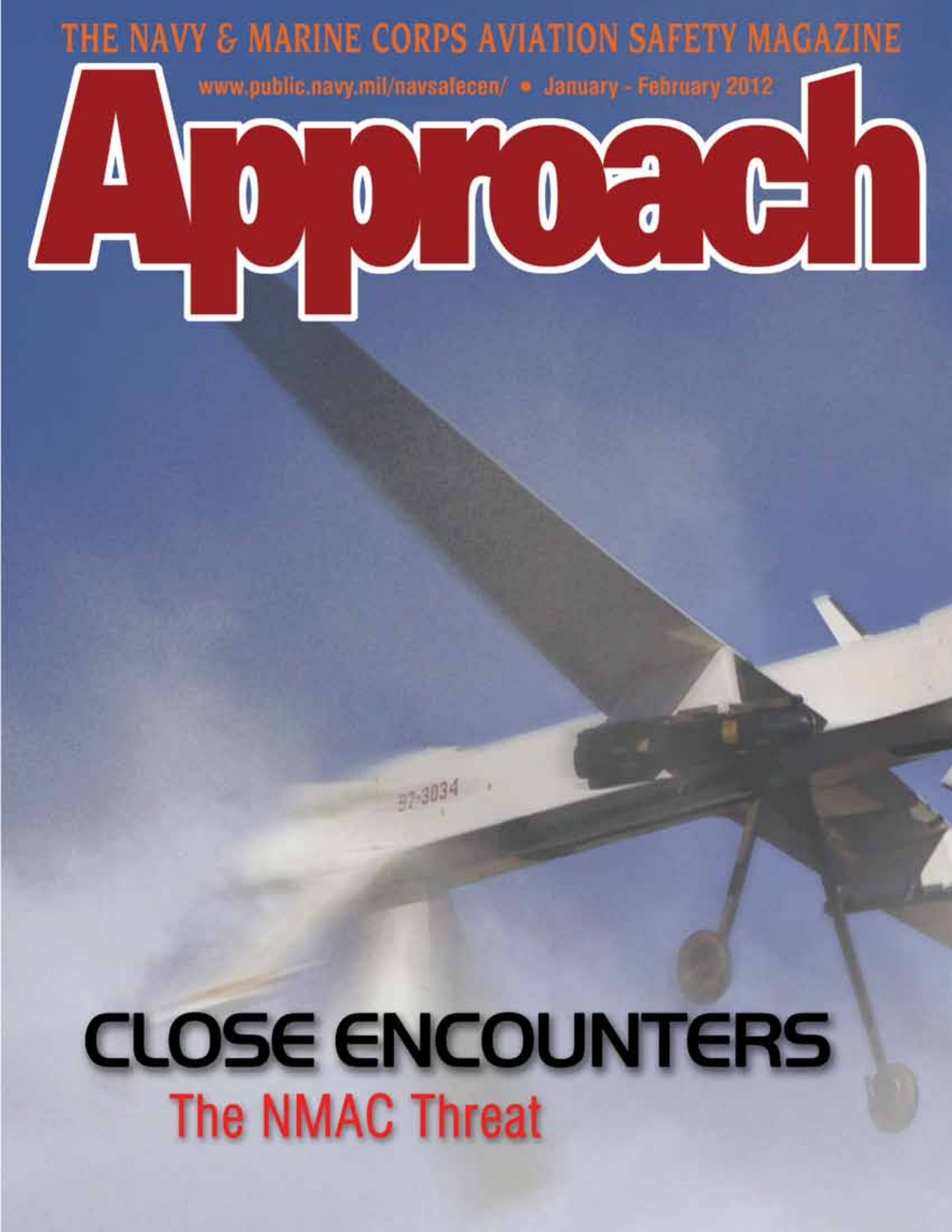
Approach



CLOSE ENCOUNTERS

The NMAC Threat

The Navy & Marine Corps Aviation Safety Magazine

January-February 2012 Volume 57, No.1

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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The "Big sky, little airplane" theory states that wide-open spaces generally preclude two aircraft from swapping paint or causing a serious mishap.

This issue offers several articles describing close encounters of aircraft. These near-midair collisions occur more often than you think, and reporting of these incidents continues to be a valuable tool for prevention. With the advent of UAS/UAV aircraft the potential for mishaps is evolving with a whole new dynamic. Let's continue to emphasis basics such as, briefings, scan, headwork and sound crew resource management (CRM).

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LCdr. David Casteel, VFA-102
LCdr. Matt Nicholas, VP-30
Ltjg. Jocelyn Liberg, VFA-211
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Web Enabled Safety System (WESS)
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NRFK_SAFE_WESShelp@navy.mil

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http://www.public.navy.mil/navsafecen/Pages/aviation/maintenance/aviation_maintenance.aspx
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Aircraft Mishap Investigations
http://www.public.navy.mil/navsafecen/Pages/aviation/investigations/investigations.aspx
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Airfield Operations/Bird Animal Strike Hazard (BASH)
http://www.public.navy.mil/navsafecen/Pages/aviation/AirfieldOperations.aspx
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Aeromedical
http://www.public.navy.mil/navsafecen/Pages/aviation/aeromedical/Aeromedical.aspx
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Aviation Safety Surveys
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Aviation Data
http://www.public.navy.mil/navsafecen/Pages/statistics/aviation/av_stats_main.aspx
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Statistics
http://www.public.navy.mil/navsafecen/Pages/statistics/statistics.aspx
Customer support
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Additional Resources

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

Command Safety Assessments
www.safetyclimatesurveys.org
Dr. Bob Figlock, (831) 641-9700/(888) 603-3170
surveys@advancedsurveydesign.com

Naval Aviation Safety Programs (OPNAVINST 3750.6R)
http://www.public.navy.mil/navsafecen/Pages/aviation/3750_Guidance.aspx

Up Close and Personal

BY CDR. RICHARD RIVERA

The sortie was your average, run-of-the-mill event in support of Operation Enduring Freedom (OEF). I had briefed to lead a section of lot 30A FA-18E Super Hornets through two vuls in the vicinity of Kandahar Airfield, Afghanistan. We were at month five of deployment, and our third month supporting combat operations. The flights had become routine.

I briefed my training officer, who happened to be making his first trip into Afghanistan, on our sensor posture once established in the target area. As is standard among the non-traditional intelligence, surveillance and reconnaissance (NTISR) and armed overwatch (AO) missions, there is a lot of heads-down time in the cockpit. We also do a lot of "looking left" to gain situational awareness as to what was happening on the ground.

To mitigate against the risk of a midair between the section, and to balance cross-check times with supporting the ground commander, I briefed that I would try to get an altitude block. I would work the bottom of the block, and my wingman would work the top of the block.

Our ingress in country led us to our "in gas." During the transit, I asked my wingman to switch to the procedural controlling agency responsible for flight-path separation in the Kandahar area. He soon responded that they weren't answering their radios. I quickly asked if he could contact the main controlling agency (CRC) in southern Afghanistan to start coordinating to work our killbox from 12,000 block 14,000 feet. Just before our first plug, my wingman confirmed that the main CRC was working our request, and we could expect that after aerial refueling (AR).

The AR on the mighty Iron Maiden went according to plan, and we exited the tanker as a section. I switched the section up the main CRC frequency for check-in, which also went off without a hitch. They cleared us north toward our killbox and told us to switch up the local Kandahar CRC for further clearance into our killbox.

After multiple attempts on the primary and secondary local CRC frequencies, I switched the flight back to the main CRC one. I then reported no communications with the local CRC. The main CRC cleared us to work the southern half of the killbox, altitude 12 block 13 (or 12,000 to 13,000 feet). As we began our descent northbound,

With the advent of webb enabled reporting (WESS) in 2006, we saw an immediate jump in mandatory near mid-air hazard reporting. We've had a slowly increasing trend in near mid-airs in the last five years. These reports range from working from the ship to working from the shore, from under control to operating VFR. They occur in military operating areas, warning areas, on low-level routes, and during takeoffs and landings at controlled fields. The big-sky theory really isn't valid. Aircrew need to spend maximum time eyes-out and with their head on a swivel.—*Cdr. Jim Skarbek, Data Management and Analysis Department Head, Naval Safety Center*

Number of Events

FY 2007	44
FY 2008	41
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the main CRC asked if we could expedite our descent to 12 block 13 for traffic working in the killbox just south of our assigned killbox. We complied, and I detached my wingman at 13,000 feet to begin his NTISR and AO. I continued to 12,000 feet. Both of us had briefed using the pilot-relief modes to precisely maintain altitude to avoid midair between the section. Upon arrival at 12,000 feet, I requested and was approved to switch to our joint-terminal-air controller (JTAC).

The check in with the JTAC was standard for this part of deployment. Overall, it seemed like it would be a quiet day on the ground, which is great news for the troops we were supporting. JTAC briefed that only two other airborne assets were working the area, one at 17,000 feet and one at 8,500 feet.

After about eight minutes of talking me through the area-of-operations (AO) update, the JTAC described some of the key buildings and features in the area that had long been Taliban safe havens or weapons caches. As I got my sensors onto the area, I scanned outside the aircraft to determine where, in relation to the landscape, these buildings were.

In a moment that proved critical, I decided to look up and clear my flight path, as I hadn't done so in quite some time. My timing couldn't have been better. I saw an unmanned aerial vehicle (UAV) - a Predator – rapidly filling my windscreen. In a split second, I grabbed the stick and pushed it hard left in a last-ditch effort to avoid the impending collision. I was rewarded for my efforts with what I estimated to be a 10-foot pass with the Predator.

I QUICKLY RELAYED TO MY WINGMAN, who still had a visual of me, that I just had a near midair with a Predator. I'm sure he could hear the anxiety in my voice. As he scanned the area around my aircraft, he also was greeted with a 500-foot pass with the Predator. The unmanned aircraft climbed quickly after our pass.

I reported the episode to the JTAC and the main CRC. When I told the main CRC, he relayed that the local CRC's radios were now operational and to give them a call. After finally reaching them on their secondary frequency, I was told that indeed the Predator was at 12,000 feet, and that my section was supposed to be working 13 block 14. I quickly relayed that I had gotten 12 block 13 from the main CRC when communications were down for the local CRC. The controller then added that the Predator was in a climb to 14,000 feet, and that my section was now cleared 12 block 13.

The rest of the hop went according to plan, with no other issues noted. I had narrowly avoid disaster, which of course brought out a few good learning points:

With no radar services in southern Afghanistan, expect the unexpected. Listen to what altitudes aircraft in the vicinity of your area of operations are receiving; then deconflict. Use all available sensors to see and avoid, including the Mark 1 Mod 0 eyeball.

When working a block of altitudes, don't work the extremes. I should have briefed that I would take 12,200 feet and that my wingman would take 12,800 feet. You can bet that the UAVs will be working the extremes or exactly on the altitude assigned.

Mission cross-check times don't just apply to wingmen. When conducting operations where you are going to be heads-down for quite some time, brief and execute a heads-out game plan to clear your flight path and your wingmans. This single action alone saved two valuable assets that day. ■

CDR. RIVERA IS THE EXECUTIVE OFFICER OF VFA-81.

Analyst comments: This article highlights a rapidly growing trend: UAS and manned aircraft filling the skies. As UAS become more prevalent, the potential for mid-air and near mid-air collisions will increase. As the author states, aviators must make sure we're scanning outside the cockpit just as often as we're scanning inside, and know who we're sharing the air with. Kudos to VFA-81 for submitting this article and reporting it in their Hazard Report 05-11. Reporting all UAS-related incidents is key to prevention.—Lt. Brian Abbott, UAS Safety Analyst, Naval Safety Center.

Stranger, Waiting, Up and Down the Boulevard

BY LT. AUSTIN HULBERT

Every time I travel "The Boulevard," the line from Journey's "Don't Stop Believing" is stuck in my head. You all know the one, the lyrics include the title to this article. I often reminisce singing the song at the bars, as I'm sure we all have done.

For those who don't know what the other boulevard is, it's the VFR/IFR corridor through Pakistan that allows coalition aircraft to fly into Afghanistan. For FA-18s coming off the boat in the Northern Arabian Sea, the trip usually takes an hour or so, and there isn't a lot to do. I usually take time on the ingress to study the products provided by the ground liaison officer (GLO) and to stare dumbly out the window like a cat.

On this day, I would launch from USS *Enterprise*

About 35 seconds later, as I looked down at my situational-awareness (SA) display to discern the linked track, I heard a "whoosh" and saw something flash out of the corner of my eye.

(CVN 65) as Dash 2 of a section of two-seat, APG-79-equipped, FA-18F Super Hornets. As a senior JO section lead, I was flying with a fairly new WSO as my crew pairing for Operation Enduring Freedom (OEF.) My lead was my roommate and also another senior JO section lead. We were proficient and experienced with more than 700 Rhino hours each, and we were comfortable flying together as a section.

CATAPULTS 3 AND 4 WERE DOWN. With only two remaining cats available, we anticipated not joining up for the trip. We launched on time, with our lead following about five minutes later. I said over tactical freq that we would meet them on the tanker and plan to head up The Boulevard as singles. Proceeding as singles isn't abnormal, and we maneuvered to take the prescribed offset at the designated altitude for our airspeed

We monitored the self-reporting frequency and made all the advisory calls. We had our radar set up to clear our nose, with the display set to 40 miles. We also were up the Link-16 network, so we could see friendly aircraft that also were in the link. The Link-16 network provides the location of friendly aircraft, though not all aircraft are Link-16 capable. With our lead 40 to 50 miles behind us, we had situational awareness (SA) of a section of Rhinos going up The Boulevard, as well as several Air Force and British tankers that were at altitude blocks above us and would not be a factor. With the perceived knowledge that our only coaltitude traffic was the section of Rhinos far ahead of us, and with our lead behind us, we settled into our routine.

Halfway through our transit, we flew above some clouds and decided to pass a pilot (and WSO) report called a PIREP. The visibility was great, but we noticed clouds at the end of our route that we wanted information about. My WSO tried to contact the E-2C to pass our PIREP and to get a report for what was ahead. I made another check on the radar and saw nothing.

After several attempts to reach the E-2C, we heard lead mention a contact he picked up on radar. Our radar was still "clean," and it appeared that he was sending his track of our aircraft. About 35 seconds later, as I looked down at my situational-awareness (SA) display to discern the linked track, I heard a "whoosh" and saw something flash out of the corner of my eye. I immediately looked over my right shoulder to see a P-3 passing behind my right wing. Like a senior citizen driving through a farmer's market, I came blowing by the P-3 with no clue to its existence. After talking to my WSO, and based on the sight picture and track-crossing rate after the pass, we estimated our miss distance to be about 20 feet with wing overlap (the P-3 crew later estimated 30 feet).

In our investigation into what had happened, we learned that the P-3's true airspeed was in the mid 200s, whereas ours was in the mid 400s, essentially giving us about 200 knots of closure. Per The Boulevard procedures, both aircraft were precisely where they were supposed to be and making all the appropriate radio calls. Given the differences in true airspeed (TAS) of each aircraft and the position of the P-3 on the longest leg of The Boulevard, it was likely we were either out of range to hear his last self-reporting transmission, or had not yet come up on Boulevard common when his call was made. Despite being up the correct frequency, and using all available onboard sensors to clear our flight path, we never knew of the P-3 until it was too late.

I took away one important lesson from this incident: You can never be too careful. I placed too much trust and confidence in my very capable onboard systems, the established Boulevard procedures, and in what I heard on the self-reporting frequency. I took deconfliction for granted and did not maintain a vigilant scan along my route of flight. What I experienced was an unrecognized loss of SA, which we all know is the worst kind. My complacency nearly caused the loss of two aircraft and over a dozen lives.

Growing up, my father kept a picture in his office of an aircraft that had crashed into a tree. Next to it was this quote: "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." I saw this picture so many times and never forgot it. Aside from the obvious lesson of not flying into trees, it reminds us that even in the most benign of circumstances, complacency can kill. This lesson was driven home that day, when 20 feet meant the difference between disaster and being here to write about it. ■

LT. HULBERT FLIES WITH VFA-211.

Unknown Unknowns

BY LT. PATRICK TAYLOR

Our air-to-air training rules enforce safety during high-risk training, and we professional adversaries like to refer to ourselves as the "Keepers of the training rules." To a large extent, we generally do a great job of this; RTOs (range training officers), RSOs (range safety officers), and red GCI (ground-controlled intercept) controllers are all important links in the situational-awareness-building chain that red air uses to "keep" the training rules. Blue air is also responsible for following these same training rules. But, we have times when everyone can do everything by the rules and still arrive at a frightening and unsafe situation.

We had a gorgeous morning for our air-wing event: no clouds anywhere in the Fallon range. I was Dash 2 in a section of F-5s, holding at low altitude to set an ambush for unsuspecting fighters. The fighters did a good job. We were detected well out at range and elevated to the bandit block (altitude sanctuary) of 12,000 to 14,000 MSL.

As the fighters closed on us, our red RTO (call sign Spyglass), gave us more information, calling, "Dog 7, north fighters BRA [bearing, range, altitude] 120, 12, 8,400 feet and descending."

I thought, "Nice. They're doing a good job getting below us."

We continued our orbit at 12,000 feet. I was in a deployed-echelon formation, similar to Tac Wing, about 1,000 feet on lead's left wing. Spyglass kept up a steady stream of SA-building communication with the red air. As we turned through south, we leveled our wings and committed along the fighters' line of bearing.

"Dog 7, fighters BRA 123, four miles, in a close combat spread."

"OK. They're somewhere right on our nose," I thought.

We were pointed into the sun, with fighters beneath our noses. I rolled up on my left wing to get a good look underneath. I saw two Hornet-shaped shadows on the hilltops in front of us.

"I can see their shadows, " I radioed to lead. I rolled back to my right hoping to spot them down low, in between our section.

As I looked back toward my lead, a Super Hornet came nose high, through our altitude, between my lead and me. He was rolling in my direction, and I could clearly make out the two white helmets and green flight suits in the cockpit as they blew by.

I still did not see the second Hornet, and I was certain that the fighters did not see both of us. Lead gained tally of both Hornets, and broke left and low to go after them. I continued ahead, looking for the second fighter. I eventually gained a second tally about the time we terminated our engagement. We pointed our jets north toward the area boundary and got out of the way.

As the two of us kill-removed from the fight, we talked on our discrete frequency about what had happened. I'm not too proud to say that it took me a few minutes to get my hands to stop shaking. My lead did not realize that we had had a close pass. He had seen the aircraft approaching underneath, but then he focused on the second fighter. He did not have the breathtaking view that I had when the first fighter split the section, and he thought it was just a good merge.

Not until after the debrief with the overall red lead did he appreciate what had happened.

From the bandit perspective, nothing was different. We knew what we'd seen, and I was confident the fighters did not tally both bandits. The debrief with the fighters confirmed exactly that: They were tally one F-5 (lead, as it turned out). The pilot who split our section, and had come to within 500 feet of my jet, never knew I was there.

How did this happen?

We knew from Spyglass that two fighters were about to merge with us. We were not tally yet, so we stayed in our block at 12,000 feet.

THE FIGHTERS WERE RADAR STRENGTH ONE, and because both saw only one bandit on radar, that satisfied their

He was rolling in my direction, and I could clearly make out the two white helmets and green flight suits in the cockpit as they blew by.

SA criteria to leave their block. Approaching the merge, they followed their radars and visually acquired my lead. Neither fighter saw me.

Appendix M of OPNAV 3710.7U contains the Standardized ACM Training Rules Briefing Guide. These rules specifically state that all participants shall be "established in assigned block by 10 nm without required SA on the opposing force." Therein lies the loophole at the heart of this issue: What constitutes required SA?

It's easy for red air to satisfy the required SA. We always have a red RTO telling us exactly who we're merging with and how many of them there are. What about the blue air? The fighters that I merged with did everything right: They were in agreement with the radar apparent strength of the group they were targeting, and satisfied the criteria for leaving their blocks in accordance with the rules. Yet the fact remains that they came just as close to a mid-air as I did. They just didn't realize it at the time.

The training rules, as they are written, make a dangerous implication. Are we, as a community, saying we think it's acceptable to arrive at a merge and engage in dynamic maneuvering without accurate SA?

What's the solution? Should we require large force exercises (LFEs) to be conducted differently?

Should blue RTOs provide the fighters with a "raid count" prior to 10 miles so the fighters know how many bandits there are?

Should fighters assume any group is "strength two" unless told otherwise by an RTO?

Should "strength" calls be made on PRI (primary frequency)? Maybe some other sensor or platform has information the fighters do not have.

Or should we go as far as saving high-aspect merges for dedicated basic-fighter-maneuver (BFM) hops, and simply keep everyone in their blocks during LFEs?

I know exactly how some of this is going to come across. I'm not a fan of watering down our training with knee-jerk reactions, and I have no desire to hamper or curtail fighters' training objectives. Unfortunately, my squadron has bitter first-hand experience of what happens when "required SA" isn't enough, and we lose aircraft and people. At least three of us were involved with this flight considered ourselves fortunate that a close pass is all that happened.

I don't know what will be the final answer, but I hope this article can generate some healthy fleet-wide discussion on ways to prevent these scenarios from recurring.

Situational awareness can be an ambiguous term, and the quality of SA can vary widely from one circumstance to another. As the training rules are currently interpreted, bad SA is more dangerous than no SA. With no SA, the fighters would have remained in their blocks, and this incident would never have happened.

As we evolve our fleet-wide, air-to-air training scenarios to replicate real-world threats using electronic attack and advanced jamming techniques, situational awareness will continue to be further degraded. We can expect an increase in low-SA merges, but ideally without a corresponding rise in near or actual mid-air collisions. Required SA should leave absolutely no room for unknown unknowns. ■

LT. TAYLOR FLIES WITH VFC-13.

A Case of Mistaken Identity

BY LCDR. JOEL DOANE

We were 20 miles off the coast of Honshu Island, Japan, conducting humanitarian assistance/disaster relief (HADR) operations in support of Operation Tomodachi aboard USS *Essex* (LHD 2). The weather was VFR.

We had just launched the first helicopter in a section of H-46 Phrogs headed to the beach. A flight of two Air Force MC-130s came cruising by the ship's port side at 250 feet and 230 knots, dangerously close to the unsuspecting helicopters in the pattern. To the uninvolved observer it was an eye-catching flight demonstration, but definitely not conducive to safe flight operations on a big deck amphib. They hadn't been cleared into our tower's airspace, and were not communicating with the Air Boss.

Once the interlopers were brought to the Air Boss's attention, the radio waves erupted with altitude restrictions, traffic calls and takeoff cancellations. Not knowing the havoc they left in their wake, the "intruders" silently departed the area. Normalcy was restored to the traffic pattern, and we carried out the remainder of the day's flight schedule.

Days after the incident, the completed safety investigation revealed what had happened. The MC-130 aircrews agreed to request a low pass near the aircraft carrier, USS *Ronald Reagan* (CVN 76). The radio operator aboard the lead C-130 was tasked with coordinating with the CVN for clearance to do the flyby. The radio operator established communications with *Reagan's* pri-fly on a radio frequency found in the Operation Tomodachi Special Instructions (SPINS), and was given their TACAN channel by pri-fly. Neither aircraft received a good lock on the TACAN as *Reagan* was about 60 miles Northeast at the time. The aircrew gave position reports to *Reagan's* pri-fly based on incorrect data measured from mapping equipment internal to their aircraft.

The MC-130s requested a fly-by, were cleared on the port side at 300 feet and instructed to report when turning final. Combat-information-center (CIC) equipment aboard *Essex* did not pick up the MC-130's IFF information. USS *Essex* amphibious air-traffic-control center (AATCC) did not pick up the flight on radar until they were six miles on the LHDs starboard bow at 3,200 feet. Concurrently, *Essex* tower cleared Tiger 05 and 16 for breakdown and launch.

Concerns from AATCC about the proximity of the two MC-130s were raised when they turned a right base putting themselves within five miles of the ship. AATCC tried to call the tower using the telephone but never established communication because the line was in use. Tiger 05 and 16 were given clearance to lift upon receiving the signal from the landing signal enlisted (LSE) as the MC-130s began their turn to final. The first indication for *Essex* tower of the approaching

aircraft was a safety call given over the tower liaison's frequency by Knightrider 10, the SAR helicopter. Knightrider 10 reported the aircraft were headed toward the ship at a low altitude from astern and at a high rate of speed.

When the MC-130s turned final, they reported three miles astern to *Reagan's* pri-fly, who did not have them in sight and cleared them to continue inbound. The MC-130s descended and lined up with the port side of the LHD, still believing they were going to see the aircraft carrier. Tiger 05 had already transitioned to forward flight when *Essex* tower tried to hold them on deck. Tiger 16 was still on deck preparing for takeoff when they were instructed to hold on deck. The MC-130s descended to 250 feet and continued toward the port side of *Essex*.

Neither of the MC-130s received traffic-collision-avoidance-system (TCAS) warnings. As the two aircraft approached the stern they saw the SAR SH-60 on the starboard side and the CH-46E with rotors spinning on the flight deck. They realized the ship did not look as they had expected. The Dash 2 MC-130 executed a break turn to the left, away from the ship, as they came abeam on the port side. *Essex* tower directed Tiger 05 to remain below 200 feet. The lead MC-130 continued until they were abeam the bow, at Tiger 05's 8 o-clock position and 600 feet away. They also made a climbing left turn away from the ship. The MC-130 flight lead reported he did not see Tiger 05 at their 1 o-clock and coaltitude with them. After the MC-130s were clear and on a flight path away from the ship, Tiger 05 was cleared for a left turn and instructed to enter the Charlie pattern for landing.

On the surface, the explanation for the incident was amusing, to say the least. You could dismiss it as "something you would only experience on sea duty." However, when we peeled back the layers of the incident, it revealed some concerns in communication and coordination deficiencies associated with large scale, close aboard, multi-organizational operations. Training was conducted internally and with all parties involved in this incident.

Despite its humorous genesis, this event provided serious lessons learned and reminded us of some valuable aviation tenets:

- Expect the unexpected when operating in a highly trafficked (aviation ready ships and aircraft) area of responsibility (AOR) among numerous users with varying aviation backgrounds.
- Never assume precoordinated operations and communications procedures or airspace controlling entities are going to keep you 100-percent safe.
- Never interject needless operations into an already dynamic and fluid environment. The "good idea fairy" has been known to kill on occasion.
- Airspace is fragile, and it is everyone's job to make it as safe as possible.
- Never forget that aviation is inherently dangerous, and always keep your head on a swivel.

The greatest take-away from this incident was that it had a happy ending and most of us had a good laugh. That said, the men and women in all branches of service involved in Operation Tomodachi are doing great things for the Japanese people, but a near mid-air collision (NMAC) and a loss of some of our warrior's lives would have left a tragic mark on these fantastic accomplishments. ■

LCDR. DOANE IS THE AIR OPERATIONS OFFICER, USS *ESSEX* (LHD 2).

ASAP—
Anymouse to the Digital Age

BY CDR. KEVIN QUARDERER

In almost 15 months since taking command of VT-10, a fine layer of dust has slowly covered our anymouse box, and we have received only one report. To be honest, that one submission was not safety related, but rather a disgruntled student who did not get his/her first choice of aircraft assignments.

VT-10 is a large squadron, flying almost 19,000 hours a year. Does this signal a breakdown in the squadron or cause me concern as the commanding officer? Not in the least. It shows a successful transition of the anymouse program to the digital age. That transition is via introduction and embracement of the Aviation Safety Awareness Program, more commonly known as ASAP.

ASAP began in October, 2005, when Commander Naval Air Forces (CNAF) directed its use as part of an overall Office of Secretary of Defense (OSD) effort to identify and reduce human factors and other safety-related items that could be attributed to aviation mishaps. The program has nonmilitary roots, originally adopted from the commercial-aviation world. From inception, ASAP has emphasized use of computer networks to broadly solicit anonymous inputs from aircrew, without threat of reprimand to those participating. Specific feedback is meant to be kept at the squadron level, and at the discretion of the CO. General trends and statistics, however are provided to upper echelon naval-aviation leadership. ASAP is about the "what" and not the "who" in safety reporting. It is meant to complement, not replace, other ongoing safety reports, such as hazeps and unit-level incident reports.

In 2005 I was fortunate enough to be the operations officer for the Maulers of VS-32. The squadron was the first fixed-wing Navy squadron to use ASAP. The beginning was modest. Although squadron aviators were willing to try the new program, participation was limited and payback in terms of safety mitigation was not immediately achieved. Roll the calendar ahead six years and you'll find an improved, matured and more broadly used ASAP program. At CNATRA, aircrew are required to provide one ASAP report for each fly day. Inputs are required even if nothing significant occurred. Submissions normally take about one minute for flights with nothing to report, and around three to five minutes if something significant took place.

The Wildcats of VT-10 collected over 1,000 ASAP reports in August, 2011. More important than the quantity of collection numbers is the quality in reporting. Squadron and airwing-wide reporting has led to numerous, actionable, safety-related items over the last year. Examples of changes stemming from ASAP include: identifying and repainting faded airfield markings, changes in local control frequencies to avoid radio bleedover, modification of a faulty T-6A OBOGS pressure switch, changes to maintenance oil servicing procedures and improved coordination with local USAF flight operations. The broad use of ASAP reporting also reflects a change in aircrew habit patterns. Starting with primary and intermediate flight training, the postflight routine for all student naval aviators is to file an ASAP report, then begin the debrief.

The squadron safety department regularly monitors this high volume of anonymous ASAP reports, with the aviation safety officer (ASO) identifying and addressing any time-critical inputs. Each month the squadron ASO also publishes a document called the "ASAP Enquirer." This document is an overall summary and consolidation of all inputs from the squadron and other participants. The Enquirer is distributed to all squadron aircrew, the airwing staff, aviation safety school, and anyone else within naval aviation who has an interest.

VT-10 has also sought modest ways to further improve how we use ASAP. The general theme for improvement has been expanded access. The expanded access includes contributors to the program and people reviewing the feedback. Following the Naval Safety Center's classic "Swiss cheese" model to aviation mishaps, any single incident could have contributing factors attributable to a variety of sources, not just aircrew. We want representatives

from any group or organization that could play a factor in an aviation mishap to feel encouraged to contribute to our squadron's ASAP collection. We have invited local air traffic controllers (ATC), contract maintenance personnel and flight surgeons to participate on a volunteer basis. The principle of expanded access is the same for reviewing feedback from our collections. In the past only the front office and safety department have reviewed this material. However, we feel that improved situational awareness gained from ASAP feedback could help a variety of groups mitigate aviation hazards. Examples of people we have included on our distribution include aeromedical professionals, base operations personnel, airwing staff, ATC representatives, and the local CNATRA N4 detachment.

The next logical question is how can we further improve the ASAP program? I believe we need to continue improving and expanding access to the program. Most naval aviators have access to some type of smart phone or personal digital assistant (PDA). We should not limit ASAP access to only government computers, especially when many flights take us away from those terminals. Instead, let's expand to smart phones and PDAs to allow inputs as soon as possible after flight or some type of hazardous situation is recognized. Concerns over ASAP cyber-security can be mitigated similar to other government online programs such as MyPay, and the benefits of expanded access will far outweigh the liabilities.

Heavily used fixed-base-operator (FBO) terminals could have ASAP icons loaded for easy access during layovers. There has also been talk of an interface to allow ASAP reports to tabulate and automatically start the formatting process for hazreps. This would be an invaluable service to an already highly tasked safety department.

My last suggestion is to find ways to cut down the notification process for significant issues, which may be time critical. If ASAP can identify those specific items, then automatically notify the CO and ASO via a text message or email, we could cut down the time required to react to a potentially hazardous situation.

I consider ASAP to be one of the more valuable tools available to the squadron. It complements other ongoing programs, even the legacy anymouse box. We will continue to ingrain ASAP into the habit patterns for student naval flight officers (SNFOs) during their primary and intermediate flight training, and look for further ways to improve the program. I have no doubt that a future SNFO who has not even started flight training will one day identify a new improvement to the ASAP program, and naval aviation will benefit. ■

CDR. QUARDERER IS THE COMMANDING OFFICER OF VT-10.

4 Channel AOA Failure

BY LTJG. JOCELYN K. LIBERG

The skies were clear, the moon was bright, and the seas were calm—an unusually favorable night for carrier qual (CQ) operations aboard USS *Enterprise* (CVN 65). Although it was only the second night of the Big E's first deployment in three years, the members of CVW-1 were anxious to finish CQ and handle any tasking sent their way.

The senior pilot and his junior WSO launched from the decks of the 50-year-old ship and proceeded to marshal for night CQ. After spending an hour caging their brains for a night trap, they commenced the CV-1 approach and dirtied-up at eight miles. Slowing to on-speed at six miles, the pilot noticed the HUD E-bracket and angle-of-attack (AOA) indexer lights flicker off and on. In the next few moments, these indications happened three more times.

As the pilot said to his WSO, "Something bad is about to happen," something bad did happen.

Now on-speed, the crew received a flight-control-system (FCS) caution. They also got an associated loss of E-bracket in the heads-up display (HUD), AOA indexers, external AOA indexers, illumination of the FCES light and an aural flight-controls alert. The aircrew immediately discontinued the approach and selected the FCS page to find that the AOA line was X'd out in all four channels. Instead of landing and heading to wardroom two for midrats, the crew began another trip around the pattern.

After turning downwind, the pilot raised the gear and selected half flaps. Established on the downwind leg, the aircrew contacted the squadron representative, broke out the pocket checklist (PCL) and began troubleshooting. The crew decided the right AOA probe was inaccurate. The right probe was stuck at 4.4 degrees AOA, while values derived from the left probe and inertial-navigation-system (INS) appeared accurate.

After several minutes on downwind, the crew was ready to come aboard. Approach vectored the aircraft to final bearing at 12 miles. Once they were established on final, they continued to complete the steps outlined in the PCL. The pilot dirtied-up, selected full flaps, and moved the GAIN switch to ORIDE, which allowed them to select the left AOA probe. Selection of the good probe returned the E-bracket to the HUD. What happened next (or in this case, did not happen) was unexpected. Contrary to the PCL, neither the AOA indexer lights nor the external AOA approach lights were restored.

The pilot promptly noticed the loss of the AOA indexer lights, although normally part of his scan. He did not feel that their loss would adversely affect his ability to fly his usual OK pass. More importantly, and still unknown to the aircrew, the absence of external AOA approach lights would leave the landing signal officers (LSOs) with no visual indication of the aircraft's energy state or gear position. The pilot used the long final leg to get a feel of the handling capabilities and concluded that although it would be rough, he could fly a safe pass.

After the crew reached tip-over, the LSO team contacted them to confirm that their gear was down

Slowing to on-speed at six miles, the pilot noticed the HUD E-bracket and angle-of-attack (AOA) indexer lights flicker off and on.

and locked, which was everyone's first indication that the external AOA lights were not functional. The exceptionally bright moon and unrestricted visibility allowed the LSOs to break out the shape of the aircraft and use day check points to determine deviations from on-speed. Had the environmental conditions not been so favorable, it was likely that unless the crew boarded on the first pass, they would have been told to divert to Oceana. While flying the pass, the pilot (a former CAG paddles) found that he needed to listen to the LSOs more than flying the ball. He maintained a steady 650 fpm descent. It was not until in-close to at-the-ramp that he felt the aircraft fly normally.

During postflight, the pilot reflected that NATOPS was correct in that power addition alone was insufficient to stop the aircraft from slowing while in GAIN ORIDE, and that significant longitudinal stick inputs were required. He also noted that simulator training for this emergency procedure did not accurately replicate the flying characteristics he experienced. This situation, in his estimate, would be a potentially difficult emergency for inexperienced aviators to handle, particularly in less than ideal environmental conditions. Another CVW-1 crew from a sister squadron experienced this same failure the next evening, further establishing the need for a change to NATOPS procedure.

After the incident, we learned this anomaly had already been reported in a fleet hazrep and was subsequently confirmed by VX-9 in a software anomaly report, but no changes had been made to NATOPS. Although pilot skill and favorable conditions helped to avoid a mishap, the event reemphasized the importance of being proactive about keeping our publications up-to-date. ■

LTJG. LIBERG FLIES WITH VFA-211.

Manage Risk to Ensure Mission Success On and Off Duty.

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Fire in the Desert

BY LTJG. JAMES MORRISON

As naval aviators and crewmembers, we've been taught the use of crew resource management (CRM). We memorize the skills and how to employ them. We are even evaluated annually on our ability to demonstrate sound CRM during our NATOPS check. Discussions about CRM usually find their way to the age-old question: Which of the seven skills is the most important to improve mission effectiveness? The consensus answer is communication. However, I believe the other skills don't get as much attention as they deserve.

I did my H2P deployment at the 2515th Naval Air Ambulance Detachment at Udairi Army Airfield, Kuwait. My MH-60S det had the misfortune of being over there the entire summer in hot temperatures our OAT gauges couldn't accurately display. We routinely operated in precautionary ranges of our equipment because of the heat and harsh desert environment.

"Medevac. Medevac. Medevac."

The "first up" crew was called out at 1500 on an urgent medivac originating at the troop medical center (TMC). The crew was through the door and out of the chocks in about 10 minutes. They taxied to the TMC pad and waited for the patient, who was suffering from a gastrointestinal perforation and needed transport to a level-three medical facility. Our destination was Al Adan Hospital, which is a local Kuwaiti hospital we routinely used.

While on-deck waiting for patient packaging, they

noticed the transmission temperature steadily rising to the 105-degree limit. Once reaching this temperature threshold, the crew turned on the auxiliary power unit (APU). This practice is often used to cool the transmission by passing a higher volume of air over the transmission's main gear box.

The temperature that day was well over 50 degrees Celsius, and the helicopter was heating up while parked on the tarmac. The engine oil temperature also rose. After being stationary for 20 minutes waiting on the ambulance to arrive, the oil temperature exceeded the normal operating range and they called base. After deliberating with the battle-watch captain, the medevac call came again; we were next up.

The first crew accepted and packaged the patient in their helicopter, while my crew ran to the aircraft for the alert launch. Once they were back on our line, the corpsmen did a quick turnover of patient custody, got him settled in our bird, and we were wheels-up heading for Al Adan. The patient was in severe abdominal pain, and we pushed our engines to their limits. The concern for the patient was to keep him from bleeding-out internally.

At the halfway point, I saw the fire light on the master-caution panel. I got that knot-in-my-stomach feeling as I turned to the HAC and told him we were on fire. He started working through the big six (or seven out in the desert with the IBF doors), and turned to confirm the fire. If the indication was a result of the sunlight being filtered through the sandy atmosphere, as our notes in NATOPS tell us, the light should go out as the exposed sensor disappears from the light with the 180-degree turn. The light remained steady, but we had no smoke, fumes or any other indications of a fire. We still had decisions to make.

The first thing that came to mind was that Al Adan was no longer our destination. The HAC delegated tasks to the crew. I was instructed to fly the aircraft and divert to Camp Arifjan, the location of the Emergency Medical Facility, Kuwait (EMFK), another level-three medical facility. The crew chief's job was to contact base via text message on the blue-force tracker. The corpsman and second crewman continued to attend to the patient and notify us if his condition deteriorated.

The HAC communicated our intentions to both Udairi Radio and Mohalab Control. He requested a direct route to Arifjan to avoid any undue delay. The crew chief reached base and told them we were diverting to Arifjan, and needed the medical team ready to accept our patient. Around 10 miles out, the second crewman raised a good point that we hadn't considered. He warned us that going to the hospital pad at Arifjan would disable the pad if we were to shut down. Also, that if we had the steady fire light, we might want to think twice about taking off after our precautionary emergency landing. Great idea.

As a crew, we decided to make a single-engine, running-approach profile to Patton Army Airfield, colocated at Camp Arifjan. As soon as our radio range allowed, we hailed Sand Sailor, the callsign at EMFK, and told them of our intentions. We directed them to have an ambulance standing by on the line for patient transfer.

We got the helicopter on deck and the patient in the ambulance. We shut down and called base. They coordinated a maintenance team to meet us at the field to inspect the engines. They found absolutely nothing wrong with the engines or fire detectors, but swapped the sensors out anyway, and we flew home that night.

The patient's injuries were quite significant. His intestines had ruptured, and he was bleeding-out from within. After getting him to EMFK, he underwent successful emergency surgery.

The mission that day was one that I reflect upon quite a bit. The HAC's decision-making process was right on. All members of the crew were assertive and voiced their inputs, which ultimately shaped the decisions that were made. We adapted to the changing environment, and analyzed what was going on and the impact of our actions. If we had landed at the hospital pad, we may have prevented subsequent medevacs from landing, which may have put other patient's lives at risk. Many variables came into play that day. It was our crew's ability to apply the seven basic CRM skills, which made the mission a success. ■

LTJG. MORRISON FLIES WITH HSC-21.

Assumptions

BY LT. MIKE SIRES

Everywhere you look there is another "death by PowerPoint" safety brief with associated abbreviations, buzz words and acronyms. Aviators are familiar with crew resource management (CRM) and the seven critical skills (DAMCLAS or SADCLAM, whichever's your preference). We're required to have annual CRM-refresher training as part of our annual NATOPS requirements. With all this training, the one critical skill in CRM that always sticks out in my mind is communication.

As a recently designated helicopter aircraft commander (HAC), I always stress communication in my preflight pilot and aircrew briefs as the critical skill that links all others together. A steady flow of communication, not only side-to-side between pilots, but also front-to-back between pilots and aircrew, is essential. The rest of the critical skills quickly become degraded or even nonexistent without communication. I've learned how quickly that can occur.

The MH-53E is a beast, and has impressive specs by any standards. However, because naval helicopter aviation is comprised of almost exclusively H-60s of some variant, the mighty MH-53E and its primary mission may be unfamiliar to many of you.

Our primary mission is airborne mine countermeasures (AMCM). We take various types of minesweeping and mine-hunting gear, lower it out the back of the aircraft and pull it through the water to counter mine threats. This mission is much more involved than that, but for simplicity's sake, we tow.

During one of these tow missions I learned a valuable lesson about CRM and the danger of assumptions. I recently had been deployed to HM-15 Det II in Manama, Bahrain, where we had been participating in an exercise for about a week and a half. I had flown a tow mission everyday for the last four days. I felt as though I finally had knocked all the rust off from not having towed much in the preceding few months.

That day, I was scheduled as the copilot for a MK-103 tow mission. Although I was a new HAC, I had not yet earned my mission qualification for attack helicopter aircraft commander (AHAC) or advanced mine countermeasures (AMCM) HAC. I was scheduled to fly with the det assistant OinC, an experienced AHAC, whom I had not yet flown with. I had flown the previous four days, each of those four missions having the same AHAC, copilot (myself) and crew.

We launched a few minutes early. Weather and visibility were good. Everything was going smoothly as we approached our stream point (when we start lowering the gear out the back). Before streaming, as per our pre-AMCM checklist, we are required to perform a 150-foot power check to make sure the HOGE (hover out of ground effect) power available is within calculated limits. This is an important check. Towing requires large amounts of power-required, while also putting you in close proximity to the water (100 feet or less). This power check is important any time of the year, but no more so than in heavy, hot and high density-altitude (DA) conditions where power available is drastically reduced.

Bahrain in late May is brutal, with typical days seeing temps above 35 degrees Celsius and density altitudes beyond 3,000 feet. Also important to emphasize is that the checklist does not specify a particular way of doing this power check, it simply states, "150-foot power check: Perform." This is when things went awry.

I was the pilot-at-controls (PAC) and was approaching the stream point, while decreasing airspeed and altitude to pull into a 150-foot hover for the power check. I descended through 300 feet at less than 500 feet/min, while bleeding off airspeed below 15 knots, and called for baralt hold to be disengaged.

The AHAC and pilot-not-at-controls (PNAC) disengaged baralt hold as requested. My assumptions and failure to communicate my perceived environment got us into trouble at this step.

My normal way of accomplishing the 150-foot power check was to secure baralt hold. I'd then immediately engage radalt hold to let the aircraft's automatic-flight-control system (AFCS) input power as we approached the preset 150-foot altitude in the radalt-hold pot. This sequence is how I had done it on the previous four flights, and by that fourth flight, the other AHAC and I were engaging radalt hold for each other automatically, without the PAC requesting it.

However, this time I was with an AHAC, I hadn't flown with, and I had no idea how he ran things. This was the worst time to make assumptions and fail to express my expectations. I did not call for radalt hold to be engaged. As I waited for the AFCS to respond with power and with my finger off the collective trim button, so as not to pickle the radalt hold, the rate of descent increased. The aircraft was still in a 10-degree, nose-up attitude.

I saw the descent rate build, but failed to input power and level the nose to stop our descent. I still expected the AFCS radalt hold to input power. As we descended past 100 feet, a crewman in the back called for power. The AHAC/PNAC came on the controls and began to input power and level the nose. The aircraft yawed to the right as more power was added. The AHAC inputed left pedal and finally called for the controls. I relinquished the controls, and the AHAC finished the recovery at 25 feet, while gaining forward airspeed to fly away. During the recovery, the engine's overtorque aural warning sounded and the overtorque caution light illuminated and stayed lit.

Obviously shaken, we called for a mission abort and formal debrief. We returned to Bahrain International. The overtorque-warning unit was read by maintenance personnel, and they determined the aircraft did not reach the NATOPS limit of 160-percent torque for one minute, but came close with highest engine torque. The No. 2 engine reached 160-percent torque for six seconds.

What did I learn? Flying with a new crew for the first time is the best time to practice strict, clear and concise CRM. Everyone must be on the same page and focused on the appropriate task.

I had become complacent conducting a maneuver I perceived to be benign, as I had done it many times before without incident. However, this power check or any HOGE situation can be one of the most dangerous things we do, especially in a hot, heavy, high DA environment. Had I taken more time and been in a hover before calling for disengagement or reengagement of AFCS, I would have avoided any situation in which a large amount of power would be required to arrest our rate of descent. Regardless of what I thought AFCS would do, I should have applied power before things got out of hand. AFCS doesn't always work, so I should have been ready for anything.

What's that saying you were told in flight school? "Fly the aircraft, don't let the aircraft fly you." ■

LT. SIRES FLIES WITH HM-15.

Major Shawn Robinson, a flight instructor, and 1stLt. Jeffrey Pardee, an advanced flight student, were on a TH-57B training flight with HT-8 at NAS Whiting Field.

While practicing simulated in-flight emergencies on a gusty day, they felt a slight, uncommanded yaw. They initially attributed the yaw to wind, but then smelled smoke in the cockpit. As Maj. Robinson tried to identify the source, he glanced aft outside and saw black smoke trailing behind their helicopter. He immediately secured the environmental-control system (ECS), suspecting the air-conditioning belt might be the source of the smoke. They assessed the situation and initiated an immediate emergency landing in accordance with NATOPS. They turned their transponder to emergency and notified the crash crew at the nearest Navy outlying field.

As discussed in their NATOPS brief, they put their pocket checklists away before reaching 200 feet. Maj. Robinson flew the helicopter and 1stLt. Pardee called out obstacles during the approach.

Once on deck, the crew shut down the helicopter and inspected the engine compartment. Molten rubber from the air-conditioning belt had splattered and blackened the inside of the compartment. Maintenance determined the air-conditioning compressor had seized, melting the belt and causing a compressor leak.

From left to right: 1stLt. Jeffrey Pardee and Maj. Shawn Robinson.

BRAVO Zulu

HMLA-169

During a preflight inspection of a UH-1Y tailboom attachment, 1stLt. Kevin Sladek identified a loose washer stack on the lower left-hand attachment bolt and immediately notified maintenance. The barrel nut and retainer had been cracked completely in half. This finding led to the immediate red stripe of all UH-1N and HH-1N aircraft because of a potential failure of the tailboom attachment barrel nut. 1stLt. Sladek's attention to detail helped prevent a catastrophic material failure.

NAS Kingsville

AC1 Kevin M. Kahler is an air traffic controller at Naval Air Station Kingsville, Texas. During T-45 field-carrier-landing-practice operations on runway 17L, the pilot of Blazer 201 was under the direction of a landing signals officer (LSO). Blazer 201 requested clearance for a practice precautionary approach to runway 17R.

The pilot reported the low-key position and was subsequently cleared for a touch-and-go. As tower controllers tried to locate the aircraft in the vicinity of low key, the LSO cleared Blazer 216, also a T-45, for takeoff on the parallel runway. As Blazer 216 began its takeoff roll, AC1 Kahler, a controller in training, sighted Blazer 201 not turning final for runway 17R as expected. Blazer 201 was mistakenly landing on runway 13R, a cross runway that intersectes the active runways. Realizing the two T-45 pilots were on a collision course, AC1 Kahler called, "Abort! Abort! Abort!" to Blazer 216 over the LSO radio frequency. The pilot of Blazer 216 heard the abort call just as his aircraft's nosewheel was lifting off the runway, and as he saw Blazer 201 closing from his right.

The pilot of Blazer 216 immediately pulled the throttle to idle, and passed below and behind Blazer 201, narrowly averting a collision. Blazer 216 subsequently performed a maximum performance aborted takeoff, and Blazer 201 reentered the pattern and landed on the next pass. AC1 Kahler's judgment and quick thinking prevented a potential mishap.

Lieutenant Robert Castor was preflighting an E-2C aboard USS *John C. Stennis* (CVN 74) prior to an operational mission. He noticed the nose landing-gear swivel nut was missing a safety wire, and that the nut was loose. He notified the flight-deck chief and the airframes troubleshooter. They confirmed the missing safety wire and quickly fixed the problem. The swivel nut is responsible for holding the drag brace to the landing gear. If this had come lose, the nose gear would have collapsed on recovery.

VAW-112

BRAVO Zulu

VMAQ-4

Left to right: Capt. James Trotter, Capt. James Goeller, Capt. Anthony Cesaro.

Marine Captain's James Trotter, James Goeller and Anthony Cesaro departed Bagram Airfield, Afghanistan on a morning mission supporting Operation Enduring Freedom. While in a descent, the EA-6B crew felt an unusual shudder, similar to flying through another aircraft's jet wash. Ten to 15 seconds later, the crew had a catastrophic right engine failure, characterized by a loud bang and a significant yaw to the right.

Captain Trotter observed the right engine rpm decaying with EGT and fuel flow displaying abnormal indications. He immediately secured the engine. The crew descended to 20,500 feet for better performance and turned back toward Bagram Airfield. Captain Goeller began to deconflict the Afghan airspace through ATC, while running through the Prowler pocket checklist for an engine failure in-flight.

The crew began a high altitude, single-engine approach to Bagram, which has a field elevation of nearly 5,000 feet. Given the history of engine failures in the EA-6B, the crew's immediate actions and decision making led to their landing with no further damage.

VT-9

Left to right: Lt. Ryan Gates, Ltjg. Jeffrey Bolstad.

Lieutenant Ryan Gates, a flight instructor, and Ltjg. Jeffrey Bolstad, an advanced flight student, were on a VT-9, T-45C training flight. They were flying as wingmen on a two-plane formation approach to runway 19L at NAS Meridian.

While at 2,100 feet at 220 knots, Lt. Gates, in the front cockpit, saw a blur to his right and heard a loud thump on the forward fuselage. He immediately realized they had struck a bird and possibly ingested it in the engine. He separated from the lead plane and maneuvered to fly a modified-precautionary approach for an opposite-direction landing on runway 1R. Ltjg. Bolstad assisted by monitoring the instruments for any unusual indications.

Lt. Gates declared an emergency with approach control and made a short-field arrested landing. Immediately after engagement with the cross-deck pennant, he shut down the engine to prevent any further damage.

A bird had hit the fuselage just forward of the starboard intake and had been partially ingested in the engine.

NO FAST HANDS

BY LT. DAN BELLINGHAUSEN

Every naval aviator is intimately familiar with the antics of the emergency-procedures (EPs) simulator. The flight seems benign at first, but then the instructor gets bored and decides to fail five different systems at once. Eventually, your indications tell you to shut down both engines and pray you hit your mark on the runway.

Executing emergency procedures is one of the fundamentals of flying. We rigorously train to them in flight school and carry those lessons to the fleet replacement squadrons and beyond. Of course, the further we get from the training command, the more tactics become the forefront of our thoughts and consume the majority of our study time. This was exactly where I found myself on an overcast December afternoon.

I had been hitting the books and preparing for my tactics level II basic-fighter-maneuvers (BFM) flight in our lot 24 FA-18F Super Hornet. After two weeks of anticipation, the day finally came. I was ready to apply the knowledge and see the fruits of my labors. Little did I realize that it was the years of EP training that I was about to apply, not two weeks of BFM fundamentals.

The day started out poorly when my weapons systems officer (WSO) and I launched off the ship into a Case III departure, with layers of clouds that went from 800 to 11,000 feet. Of course, we would just set a higher hard deck to stay out of the weather, so our training flight was still on.

As we headed to the tanker, the aircraft shuddered. It felt like it came from the left side of the aircraft, and we agreed that it must have been a compressor stall in the left engine. We checked for maintenance codes indicating a stall, but there were none, so we decided to continue with the mission.

After in-flight refueling, we proceeded to join on the lead aircraft and felt another shudder. Still no codes, but this time, the hair on the back of our necks stood up. We continued once again into the G-awareness maneuver. That was when we knew something definitely was wrong. In the middle of the 4G turn, the aircraft suddenly shook violently, the nose pitched down, and we couldn't keep altitude. Quickly recovering the aircraft and pulling the throttles to idle, we checked the maintenance codes one more time, and, sure enough, the code indicating a compressor stall appeared. Solemnly, we cried "Uncle," cancelled the mission, and pulled out the pocket checklist (PCL).

We began the EP for a LEFT ENGINE STALL caution, which directed us to slowly move the throttle from idle to military (mil) power. Halfway to mil, the aircraft greeted us with a series of pops and tremors. The LEFT ENGINE STALL caution appeared, and that wonderful female voice in our headsets began

sweetly singing, "Engine left, engine left."

We pulled the throttle back to idle, which extinguished the caution and ended the continuous bangs from the motor. We called the tower representative and came to the unanimous conclusion that we would leave the left engine at idle until commencing final approach on a straight-in to the ship.

Just as the rep was about to leave the radio, a HYD 2A caution appeared on our left DDI. We heard that wonderful two-frequency warble that all Hornet aircrew have come to know and love as their caution tone. We told the rep of our "good" fortune and subsequently reattacked the PCL. We knew the HYD 2 circuit was run off of our right and only good engine.

The HYD 2A caution was soon replaced by a HYD 2B caution, and our relative calm was replaced by consternation. The cycling of cautions we had just witnessed was an indication that our hydraulic system was leaking fluid. The reservoir-level-sensing (RLS) system was trying to isolate the leak by shutting off the hydraulic circuits one at a time. If the leak could not be isolated, we would soon see the HYD 2B caution go out, and be replaced by both HYD 2A and HYD 2B cautions, trying to shut off both circuits entirely. Besides being run by the only good engine, this hydraulic system also happens to power aircraft-utility systems such as the landing gear and in-flight-refueling (IFR) probe.

THE DILEMMA WE FACED was that the F-18F flight controls were completely dependent on hydraulic power; there is no mechanical back-up. If both hydraulic systems failed, we still would have one usable engine, but no hydraulics to power the flight controls. The jet would subsequently depart from controllable flight, and our day would be ruined.

Our situation was not dire yet, because the left engine seemed to be functioning at idle. As we continued to execute the procedures, the HYD 2B caution went out, indicating that the RLS turned it back on, but the system was still leaking. The HYD 2 needle had been steady at 3,000 psi, but then it began to oscillate, which is never a good sign. The pressure started to decrease, and the oscillations grew in amplitude. The HYD 2A and HYD 2B cautions tantalizingly flickered on the DDI, while the needle jumped between 1,500 and 2,500 psi. Ironically, as our hydraulic system bled, we heard loud, unsympathetic popping sounds from the left engine while at idle. We quickly found ourselves deeper and deeper in that dreaded EP simulator scenario.

This was where the axiom "NATOPS is not a substitute for sound judgment" came into play. For the problems that were occurring, the left engine compressor stalls and the right engine hydraulic failure, the PCL directed us to shut down each engine. That was a poor choice considering the only landing area within reason was a postage stamp in the middle of the ocean. Common sense dictated that we shut down neither of them.

With that decision firmly made, we confronted the next decision: when to extend the landing gear. The PCL can tell which steps to accomplish but not neces-

sarily the best time to do them. We were tempted to lower the landing gear while we still had an operating hydraulic system, rather than blowing down the gear using the emergency method and sweating if it would work. Our concern with that action, however, was not getting the gear up if the ship was not ready to take us; we'd have to fly a dirty bingo profile without enough gas. We decided to leave the landing gear up until the ship gave us vectors for an immediate recovery. Then we'd emergency extend the gear and the IFR probe.

The HYD 2 system eventually lost all hydraulic fluid, and the HYD 2A and HYD 2B cautions permanently appeared. While we expected this to happen, we did not think ahead to the accompanying cautions and uncommanded actions that would follow. A flight-control-system (FCS) caution appeared, along with indications the right leading-edge flap and right rudder were unusable, and were accompanied by a sharp roll 20 degrees right-wing down. We did an FCS reset to restore power to those flight surfaces, and after several attempts, power was restored and the FCS caution went away.

During our descent from marshal, however, the aircraft again unexpectedly rolled right-wing down, accompanied by the same FCS caution (flight-control failures), with the addition of a FLAPS OFF caution. We regained control of the aircraft by compensating with stick and rudder, and we continued to fly the approach. As we urgently maneuvered closer to final approach, our problem was exacerbated with more EPs to review, and an unknown amount of time and gas to find a suitable solution.

Before accepting the turn to final bearing, my WSO and I had to complete the following seven different procedures: HYD 2A/2B, FCS, and FLAPS OFF cautions; emergency gear extension; controllability check; single-engine approach; and single engine in landing configuration. Although we felt pressed for time, we still methodically went through each procedure. Satisfied that our configuration was controllable and all procedures were complete, we accepted our vectors to short final. As one last measure to ensure full controllability, we tried several more FCS resets to regain the lost flight-control surfaces. Our efforts were rewarded with success—but not for long.

As planned, we matched the left throttle with the right at three miles and tipped over. All was well until 2.5 miles and 1,000 feet AGL when the aircraft, once again, rolled 20 degrees right-wing down with the same FCS failures. With our bucket completely full, we unwisely tried five or six more FCS resets. We then realized that we shouldn't try any more resets for fear of them failing again while we were about to land on the ship.

Of all the times to fly a great pass, this was it. Slightly high all the way down, it felt like the best approach of my life as we snagged the three-wire, bringing us back for pizza and near-beer.

Everyone knows the saying, "Hindsight is 20/20." While consumed in the moment, there are facets of the problem you might not see, even though they are glaringly obvious to an outside observer. One of those variables we did not immediately recognize was the danger of resetting the failed flight-control surfaces and having them fail again on final. Also, what if that left motor failed? We could have gambled with having enough hydraulic fluid left to emergency extend the gear. A better solution was to have kept the right engine above 80-percent rpm to provide enough airflow to crank the left engine.

One last lesson learned was that gas is a precious commodity in the carrier environment. If you can't land on the boat, you better have enough fuel to get to the beach, or you place your fate with the barrier. Gas was not a big concern at the time of our emergency, so our rep recommended leaving the IFR probe retracted because a bingo profile would overspeed it if it was extended. He, too, had experienced a case of Monday morning quarterbacking. Once down to max trap landing weight, we certainly would have been in fuel extremis if the boat was not ready to take us aboard. However, we were well out of range for a dirty bingo.

In spite of all of my hard work to further my progression towards BFM subject matter expert (SME), it turned out to be fundamentals of flying and not tactics that ruled the day. In hindsight, we can honestly say that we stuck to the basic principles of flying. No fast hands in the cockpit. Common sense rules. And, of course, aviate, navigate, communicate. Those were not all that helped us succeed, though. A solid application of crew resource management (CRM) helped us adhere to those principles, as we maneuvered through the obstacles of our emergency.

The next time you are about to poke out your eye while mired in the muck of tactics, take a break and talk with someone about situational emergency training (SET), the "what ifs" of an actual emergency. ■

LT. BELLINGHAUSEN FLIES WITH VFA-102.

Fire on the Line

BY CAPT. DAVID HAAKE, USMC

When I arrived at work that morning at MCAS New River, I was unaware I was on the flight schedule as the functional-check pilot (FCP). I was med down and hadn't rechecked the schedule after it had been routed through the command the day earlier; however, I had verbal permission from the flight surgeon to conduct ground turns if needed, with no intent to fly.

The V-22 Osprey operations and safety departments had received my down-chit, so I rationalized there was a valid reason to put me on the schedule as the FCP. I called the operations duty officer (ODO) to let him know I was inbound for my brief and discovered the ODO had no idea he was also on the schedule. I called maintenance control to get the test schedule and learned that only one aircraft required a ground turn. Because there were no actual flights, I decided to not question the operations department scheduling me as the FCP.

It was a busy week for the squadron. They had just concluded their week-long Commanding General Readiness Inspection, and were conducting a post and relief ceremony for the Sergeant Major. Because of the squadron's focus on ground activities, the last time I had started or flown an aircraft was more than 37 days ago. It did not occur to me that the combination of all these factors would be detrimental to the conduct of my ground turn.

At the conclusion of the post and relief ceremony, most of the squadron departed to the SNCO club for the reception party. However, the assigned crew chief and I, along with several maintainers, remained behind to do the ground turn. My copilot was not required to be present for a ground turn, so I insisted he join the the reception. After receiving a brief with maintenance control and screening the aircraft book, the maintenance-control rep said, "The aircraft is up to engine start." This which means all preentry and prestart checklist items have been completed, and the aircraft is down

to the engine-start checklist for the pilot.

As I arrived at the plane I saw the engine-intake covers were still in place, and a number of maintainers were moving in and around the plane. Before I put dowm my gear to conduct my preflight walk-around, I noticed my crew chief and an avionics Marine troubleshooting something in the cockpit. I interrupted my preflight to talk to them. I wanted to help resolve any problem and finish preparing the plane for engine start. As I climbed in the cockpit, my crew chief said he had been troubleshooting a flight-control-system (FCS) problem. The problem was fixed with the PFCS/RESET button, which is a software reset of the flight-control-system failure, and completion of another preflight built-in-test.

My crew chief hopped out of the seat, connected the long ICS chord, and manned the fire bottle located 15 feet in front of the plane's nose. I began the engine-start checklist. As I arrived at item No. 16, I inquired, "Aircraft/Intakes…Clear? Are we ready to start No. 2?"

I looked out the cockpit window to the right nacelle and saw flames rapidly burning out the bottom of the nacelle at the exhaust.

My crew chief responded, "Yes sir, we are cleared to start No. 2."

Typically, I verify the engine-intake covers are removed as per the engine-start checklist. However, because I was complacent, I did not glance to the right to verify the intakes were actually out. I moved the engine-control lever (ECL) to Start.

All engine instruments were normal until I heard the words, "Fire! Fire! Fire!"

I looked out the cockpit window to the right nacelle and saw flames rapidly burning out the bottom of the nacelle at the exhaust. That's when I knew the intake covers had not been removed. I immediately realized there wasn't an aural tone or voice with any accompanied cockpit indications of an engine fire. I shut down the engine and executed the Engine Fire on the Ground procedure. All steps were completed correctly except, "If fire persists: 3. DISCHARGE button-Press."

Because of no aural or visual cockpit indicators, combined with the chaos going outside, I failed to press the discharge button (located next to the annunciator light) per NATOPS. There is not, however, an EP for nacelle fire because of the location of the fire sensors, which are in the engine compartment along with the fire discharge bottles.

I egressed out of the plane and saw Marines running in all different directions, some not knowing what to do. My crew chief tried to put out the fire with his Halon fire bottle, but it sputtered empty and was useless because of lack of pressure or user error. Meanwhile, I yelled for Marines to grab the portable fire extinguishers out of the plane. Others grabbed another Halon fire bottle, but it did not work. It produced the same result as the first: sputtering only small amounts of Halon. After a minute, a third Halon fire bottle was grabbed from another squadron's line and the fire was extinguished.

MY NEXT CONCERN WAS TO CHECK and confirm that nobody was hurt. I also made sure everyone was away from the plane and the toxic fumes. As I got ready to call the ODO on my cell phone, I noticed thecrash-fire-rescue crew was en route to the scene.

Because of the mishap, I spent an additional four months out of the cockpit before my next flight. I had to experience not only an aviation mishap board (AMB), but also a field flight performance board (FFPB) to decide what disciplinary actions, if any, would take place. Ultimately, I appeared in person at a flight status selection board (FSSB) to determine if my aviator qualification was to be revoked. The amount of stress involved in that process is something I never would have imagined in my aviation career. The end result is that I kept my flight status as an aviator.

The decisions I made that day leading up to the mishap proved to be costly, and could have been avoided if a more conservative approach was used on all accounts. We hear the term complacency when we learn of others' mistakes involving mishaps, and my mindset that day was indeed complacent. Even though it is normal in the V-22 community not to have a copilot or conduct a NATOPS crew brief for a ground turn, because I had been out of the cockpit so long, it would have been beneficial to have my copilot there to back me up.

Do not allow distractions to divert you from your normal routine and habit patterns, such as a walk-around preflight. ■

CAPT. HAAKE FLIES WITH VMM-365.

Please send your ORM questions, comments or recommendations to:

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The Poor Man's Simulator

Chair flying is a tool that can create the flight environme during dynamic situations. When the real situation occ

BY LT. DANIEL SOLFELT

I clearly remember my first introduction to chair flying. Our primary flight-training instructors gave us a poster of the cockpit and told us to tack it to a wall in a quiet room. We were to visualize going through procedures all the way from preflight to landing. They told us not to just think about it, but to actually move our hands and speak the required comms. I thought it was a ridiculous way to study, because as long as I memorized the procedures and could repeat them that would be enough. I quickly learned, however, there is a large difference between having something memorized at 1G and having that information so engrained in your memory that you can access it during chaotic and difficult situations.

Somewhere between flight training and the transition to the fleet, I realized the emphasis placed on chair flying at the beginning of my career had been lost. Although this is partly a result of gaining experience in aviation and the availability of simulators, the technique of chair flying is disappearing among new fleet aviators.

As a new guy, finishing my first combat cruise, my experiences have led me to firmly believe that the key to not just "getting by" in your transition to fleet aviation, but to excelling, is consistent chair flying.

We assume that, as a new aviator, you will be studying NATOPS and tactical knowledge, but unless you are practicing that knowledge outside the jet, you will be nowhere near as effective or as quick of a study. I have come to appreciate that chair flying is an excellent substitute when simulators are unavailable. It will greatly increase your confidence, situational awareness, and skill.

The title for this article was originally, "The Lost Art of Chair Flying." However, I came to realize that chair flying is most definitely not an art.

Although memory formation is not fully understood, it is widely agreed that two of the main types of memory are short term and long term. Information that is initially placed in short term is transferred to the long term by repetition and practice.

Even when information is stored in long-term memory, it may not be immediately accessible.

nt, albeit in your mind, and allow you to practice procedures urs, your response will be second nature.

Emotions and environmental distractions can make it difficult to extract information from long-term memory. There is no debate that naval aviators experience extremely strong emotional responses and chaotic situations in the cockpit. For anyone who has ever tried to recall complex tactics while flying on NVGs during blue-water operations in questionable weather, this seems simple. It is one of many reasons you may have a tactic memorized on deck, but once you get into the jet, it can be extremely difficult to recall even the most basic bit of information.

Chair flying is a tool that can create the flight environment, albeit in your mind, and allow you to practice procedures during dynamic situations. When the real situation occurs, your response will be second nature. Chair flying allows the aviator to experience emergencies, tactics, and flight procedures on the ground before they happen in the air.

I have heard many people say they have tried chair flying and it doesn't help them. In most cases, that aviator is probably not properly chair flying. Chair flying is not merely thinking about the sequence of events in a flight or reviewing the kneeboard card. It is not verbally reciting emergency procedures. There is certainly nothing wrong with these study methods — they are critical. My definition of chair flying goes two steps further.

To chair fly a sortie, you must mentally place yourself in the cockpit, and go through the entire flight from beginning to end. You create in your mind what you will see on the displays. Physically move your hands to mimic switchology changes, move the stick and throttle for dynamic maneuvers, and visualize what you will see inside and outside the cockpit. Where will your lead be in the canopy after the maneuver? Where is the throttle going during the roll in? When do you reset your radalt between the bombing and strafing pattern?

CHAIR FLYING is not better than the simulator, but it forces you to study in a different way. Unlike the simulator, there are no outside cues telling you what is coming next. In the simulator you can react to what is happening around you, but in chair flying you literally must stay ahead or you can't continue because your mind will draw a blank, which means that you could have made a mistake in the flight. The mistake can now be corrected before ever leaving the ground.

Many methods are used to prepare for a flight, and every aviator develops their own unique style. Chair flying may not work for everyone, but there is a reason that the Blue Angels chair fly as a group before every practice and every performance. There is a reason that is it has been preached by flight instructors for decades. Many professional athletes, golfers, and race-car drivers use various visualization techniques that equate to a type of chair flying. Politicians verbally rehearse their speeches.

The bottom line is, any extra studying or preparation will make you a better aviator. Maximizing the effectiveness of your time is critical. When on the ship or when simulators are unavailable, chair flying is a great option and can make you a better aviator. It takes effort and is not easy, but if you try it you will be pleasantly surprised in the air. ■

LT. SOLFELT FLIES WITH VFA-81.

Mishap-Free Milestones

HC-2	50,000 Hours	7 Years 4 Months

Life in Slow Motion

BY CDR. TONY PARTON

After 18 years in the cockpit of a P-3, I've gained a lot of confidence. The airframe has been good to me, and while I have certainly been in some scrapes over the years, things have always come out alright. This is a short story about how my old friend decided to test my judgment and give me a renewed sense of the inherent dangers of aviation.

I was flying a touch-and-go to runway 28 at NAS Jacksonville from the left seat for proficiency. My copilot was an experienced student getting requalified before returning to his department head tour. Winds were from 260 degrees at 13 knots, gusting to 21. I briefed an approach flap touch-and-go, with an approach speed of 138 knots. This approach would be a breeze.

I touched down on speed at 131 knots and waited for my copilot to reset my trim and call "Go." When he called it, I reset take-off power and began my acceleration back down the runway. I was satisfied with my performance. We were at the 4 board, with speed increasing through 125 knots, when it appeared that all electrical power had dropped from the aircraft. Life then entered one of those surreal moments of slow motion, as a very dangerous situation rapidly evolved.

A quick look at the cockpit seemed to confirm that all electrical power was gone. I didn't have time to ponder how this was possible with three generators, but a warning flag fluttered in my mind. No electrical power would also mean no hydraulic power. With no hydraulic power and no time to go boost out, rotation was not an option.

"Abort!"

I pulled back the power levers and scanned my airspeed. Without electrical power, I couldn't pull the power levers over the ramp until below 125 knots because there would be no electrical pitchlock reset. I would be in danger of pitchlocking all four props.

My vision focused on the runway. I became very mindful of how rapidly it was disappearing when power suddenly returned to the aircraft. While it had seemed like an eternity, I had been without power for only about three seconds. I happily initiated a reversal when the indications of the No. 2 engine caught my eye; it had flamed out.

"E-handle No. 2," I called.

"Check-me two," the student flight engineer returned.

"You have two," I returned, the e-handle coming out on queue.

I continued a three-engine reversal and came heavily on the starboard brake, ready to come on the port brake if it became necessary (mindful that I had no way to cool the port brake with the No. 2 engine out). The aircraft graciously decelerated. I began to breathe again as the last turnoff was coming up on the left, and I was slow enough to make the turn.

"Tell ground I need a moment," I told my copilot while turning off.

If this situation happened to me, it could happen to any pilot in any airframe. This was the rare convergence of a very critical phase of flight, and an unlikely combination of system malfunctions. In these moments, a pilot has to rely on training, systems knowledge and CRM. The No. 2 engine probably had flamed out right before the power loss, but no one was quick enough to catch it. The electrical system wasn't working as it should, and I momentarily had no power. This meant that a series of quick decisions needed to be made, and any wrong decision had the potential to result in disaster.

Take my story and stay vigilant until you shut down engines for the last time. You never know when an old friend is going to see if you still have what it takes. ■

CDR. PARTON IS THE CPRG SAFETY OFFICER AND CURRENTLY FLIES WITH VP-30.

Editors note: This is an excellent example of proper execution of time critical risk management (TCRM) using the ABCD model. For more information on TCRM refer to the Naval Safety Center website ORM page or the OPNAVINST 3500.39C.

Do not allow **distractions** to divert you from your **normal routine** and **habit patterns**, such as a **walk-around** preflight.

–Capt. David Haake, USMC, VMM-365