THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

www.safetycenter.navy.mil • July-August 2008

Approach

COMMAND Excellence

The Navy & Marine Corps Aviation Safety Magazine
July-August 2008, Volume 53 No. 4

Mishaps waste our time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission, and that any losses are due to enemy action, not to our own errors, shortcuts or failure to manage risk. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous enough; the time to learn to do a job right is before combat starts.

Approach (ISSN 1094-0405) is published bimonthly by Commander, Naval Safety Center, and is an authorized publication for members of the Department of Defense. Contents are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the U.S. Navy. Photos and artwork are representative and do not necessarily show the people or equipment discussed. We reserve the right to edit all manuscripts. Reference to commercial products does not imply Navy endorsement. Unless otherwise stated, material in this magazine may be reprinted without permission; please credit the magazine and author. *Approach* is available for sale by the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Telephone credit card orders can be made 8 a.m. to 4 p.m. Eastern time at (202) 512-1800.Periodicals postage paid at Norfolk, Va., and additional mailing offices.

Postmaster: Send address changes to *Approach*, Code 71B,
Naval Safety Center, 375 A Street
Norfolk, VA 23511-4399

Send articles and letters to the address above, or via e-mail to the editor, jack.stewart@navy.mil.

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Photo composite image by Allan Amen.

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July-August Thanks

Thanks for helping with this issue…
Rob Koon, NAVAIR
Lt. Trevor Hermann, VRC-40
Lt. Jason Morton, HSC-25
Capt. Kyle Haire, USMC, VMFA(AW)-553
LCdr. William Fraser, VAQ-136
Kimball Thompson, NSC

Admiral's Corner

From RADM Arthur Johnson
Commander, Naval Safety Center

Focus on Command Excellence

As soon as the wheels lifted from the runway, the young student naval aviator and the instructor heard and felt a "thud." They quickly assessed the situation, completed the checklist steps, and landed—a scenario custom-made for *Approach*. The classic "there I was" story about a harrowing in-flight event is the cornerstone of *Approach* articles and a great teaching tool that adds to every aviator's bags of experience and knowledge. While something went wrong to prompt the story (a bird strike in the case above), something also went right (the crew's actions). They returned to debrief and tell their tale. The crew's actions are representative of aviators and commands who train and fly at a high level. This issue contains several features about programs that can contribute to this high-level performance.

We start by recognizing commands that have shown a high level of excellence, a result of doing it right. Our 2007 award winners are listed on the "Initial Approach Fix" page. The awardees have earned and deserve this recognition.

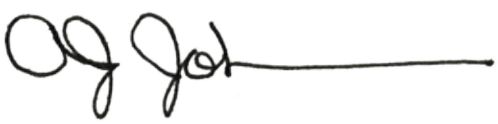
Ensuing articles discuss several of our programs to help commands achieve excellence: safety surveys, culture workshops, and safety-climate-assessment surveys. An article on each program provides information and contact data.

While we devote much time to discussing and analyzing what went wrong, we also should emphasize the positive steps and actions of our aircrew and maintainers. It's not so much a "there I was" concept but a "here's what we did right" concept. Our Bravo Zulu features are good examples.

Successful commands are distinguished by their combat readiness, mission accomplishments, inspection results, retention, and safety. From the most junior Sailor or Marine to the commanding officer, when everyone is focused on common goals, command excellence will follow.

I want to conclude with a topic that concerns all of us. When we lose young Sailors or Marines in motor-vehicle accidents, we lose people's sons, or daughters, spouses, moms, dads, and friends. We're in the middle of the summer season, so take proactive steps to promote and enforce safe driving. The Naval Safety Center wants your command to be successful, and that means no one loses their life because of an accident. Our website has tools and resources to help you make that happen. Go to: http://www.safetycenter.navy.mil/seasonal/criticaldays/default.htm

Take the steps to do it right—focus on excellence.



Command Excellence Through Safety

The Naval Safety Center is proud to announce the winners of the safety awards for CY07

CNO Aviation Safety Awards.

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

COMNAVAIRLANT

VFA-86	VFA-143	VAW-123	HS-15	HSL-42
HSC-26	VP-30	VS-32	VX-1	

COMNAVAIRFOR

VFA-147	VFA-154	VAW-115	HS-6
HSC-21	VP-40	VQ-2 (EW)	HSL-37
VAQ-138 (Pac deployed)		VAQ-137(Lant deployed)	
VAQ-142 (Expeditionary)		VQ-7 (TACAMO)	

COMMARFORCOM

HML/A-269	VMR-1	VMM-263	VMGR-252
VMFA-251	VMAQ-1	HMM-365	VMAT-203
VMAQ-3	VMFA (AW)-533		

COMNAVAIRSYSCOM
Naval Test Pilot School
Fleet Readiness Center, Southwest

COMMARFORPAC

HMM-262	VMGR-152	HMH-463	HMH-362
HMH-363	HMM-268	VMA-211	HMM-161
HMLA-369	VMA-311	VMFA(AW)-242	VMFA(AW)-121

MCAF Kaneohe Bay

COMNAVAIRFORES

VFC-12	VFC-13	VP-69	VR-1
VR-54	VR-56	VR-58	HSL-60

CG FOURTH MAW

HMLA-773	HMLA-775(-)	HMLA-773, Det. A
VMGR-452	VMFA-142	HMM-774

CNATRA

VT-3	VT-4	VT-7	VT-21
VT-28	VT-31	HT-18	

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

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

Winner
Fourth Marine Aircraft Wing

Admiral Flatley Memorial Award

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

Winners:
USS *Enterprise* (CVN 65) and Carrier Air Wing 1 (CVW-1)
USS *Kearsarge* (LHD 3) and 22nd Marine Expeditionary Unit (22ND MEU)

Runners-up
USS *Kitty Hawk* (CV 63) and Carrier Air Wing 5 (CVW-5)
USS *Essex* (LHD 2) and 31st Marine Expeditionary Unit (31ST MEU)

Grampaw Pettibone Awards

Presented to the organization and individual who contribute the most toward aviation-safety awareness through publications.

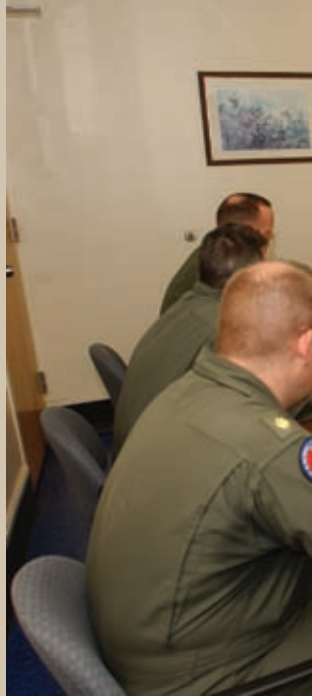
	Winner	Runner-up
Unit awards	VFA-86	VT-10
Individual awards	Maj. Micah Curtsinger, USMC (VT-7)	**Runners-up** Cdr. Skip Trahan (HS-15, 2515TH NAAD) Lt. Ron Martin (HSL-47)

Bravo Zulu

The following squadrons submitted five or more aviation 3750 hazard reports using WESS during the first quarter of FY08:

VFA-115	VFA-125	VFA-154	VFA-2	VP-30	VP-8	VP-1	VP-45	VAW-124	VT-28
VT-31	VT-7	VT-35	VQ-2	VQ-7	HSM-71	HSL-49	HSC-26	VRC-30	VRC-40

Naval Safety Center Supports the Fleet Aviation Topside Survey Team



By Dan Steber

A team of aviation and maintenance safety professionals from the Naval Safety Center (NSC) visit more than 90 squadrons every year. They share the knowledge and best practices found at commands around the globe during their one-day aviation safety reviews.

This team is tasked to review a unit's operations, maintenance, training, NATOPS, aeromedical, and safety programs. On recent trips to North Carolina's MCAS Cherry Point and MCAS New River, I watched the team in action when they looked at a couple of topside programs. The team leader, LtCol. Jon MacCartney, USMC, was joined by Cdr. Don Delorey, LCdr. Jason Domzal, and Maj. Scott Nicholsen, USMC.

VMM-162, the Golden Eagles, at MCAS New River, was the first command visited. As I looked around the Gold Eagles ready room, it was clear this squadron takes safety seriously. CNO Safety plaques ran down one complete wall: 1956, '71, '83, '90, '96, '98, '99, '00, '01, '02 and '03.

LtCol. Karsten Heckl, commanding officer, briefed his personnel about the visit. He addressed the command's past challenges during group and ADMAT inspections, saying, "We've been adamant about doing things the right way. The staff NCOs across the command are good, and they are known across the community."

Then LtCol. MacCartney introduced the team and told the CO and the command, "We'll give you a good honest look. And when we walk away… we leave with nothing; the results stay with you."

That point has been a cornerstone of the Naval Safety Center's surveys. The team commonly refers to it as the "white hat" approach, meaning no punitive results come from the survey. The team evaluates the unit's programs, identifies and offers fixes for problem areas, and outbriefs the squadron's program managers and skipper. It then is up to the command to take action, fix any discrepancies, and make improvements in all areas. The survey results are not reported to the unit's or the Center's HHQ.

Capt. Scott Shideler, 1stLt. Robert Wicker, and the DOSS, Maj. Brian Smith, worked with the Safety Center team.

LCdr. Domzal led the review of the safety department. His goal was to pass along best-practice information, while conducting a thorough evaluation. He also discussed WESS, saying, "We have to get away from the thought, in reference to naval message hazreps, that 'this is the way we always have done it.' WESS is here to stay, and we have to complete hazard reports using WESS." He also offered some good advice: "If you're having problems, call your Naval Safety Center analyst. If we can't help, we've got the phone numbers to people who can. Call me."

Following hours of looking at one program after another and discussing current safety objectives, Maj. Smith said, "I'm pleasantly surprised at the survey. This NSC program is a good thing, and they are here to help."

Maj. Smith added, "We're deploying, and it's important to get that look… a chance to step back and be objective. The survey team took time to talk with us and share the things they have seen from around the fleet. Another nice thing is that we didn't have to shut down; we ran a normal day."

Maj. Christopher Browning and Capt. Rachel Mathes of operations worked with Maj. Nicholsen. They walked through the pilot-training process and


Photo by Dan Steber

reviewed specific qualifications. They also discussed simulator and cockpit training, or as Maj. Nicholsen calls it, "a mish-mash of issues."

The discussion shifted to emergency, boldface procedures and interaction with the crew chief, who, in a V-22 aircraft, operates more like a flight engineer.

Maj. Browning liked the survey process. "The nice thing is we shared information and had a thorough and thoughtful discussion about ops and safety. We are a new squadron in a new type of aircraft. We didn't have any footprints to stand in. Our people are from various communities: helicopters and fixed wing. That fresh blood is a good thing, and we get new ideas with this mix of people. Someone will say, 'We used to do it like this in my last command.' We can flesh out that idea and see if it will work with us."

Cdr. Delorey, our aeromedical team member, worked with the squadron's flight surgeon and corpsman on a safety-awareness survey and aeromedical programs. Their portion of the survey reviewed sleep, fatigue, and off-duty issues, including their impressive 100 percent seatbelt-usage result. This percentage is as it should be, but such a high number rarely is found during surveys.

During a debrief, LtCol. Paul Ryan, the executive officer, who said, "From PFT to rifle range to working in the hangar, we have a good squadron, and we thank you for looking at us and making us an even better squadron." The day ended about 1830.

The next day, the team visited VMAQ-1 and followed a similar schedule.

The commanding officer, LtCol. Shane Conrad, USMC, and Capt. Michael Murray, the assistant maintenance officer, held a prebrief with our Safety Center team. "We appreciate your coming down to look at us," the skipper said, "I think you'll find a really good group of professionals."

LtCol. MacCartney echoed his earlier statement about the survey team not reporting up the chain of command but added, "We hope to find best practices that your command may want to share with us."

That one sentence summed up an important value of the survey process. A squadron gets a "free" look, but the Navy and Marine Corps win because of the sharing of ideas, programs and effective efforts that may work at other commands in the fleet.

No squadron is perfect; some are a little better than others, but every maintainer and aviator is doing their best to make things safe.

Maj. Geoff McKegl, Capt. Morgan Flores, and 1stLt. Julian Dodd of the VMAQ-1 safety department went through the checklist with the NSC team. They asked questions about the human factors and safety councils and discussed the CO's desire to have enlisted involvement. LtCol. MacCartney recommended they add it to their local instruction, "Institutionalize it, so when people leave, the policy is set. Stick it in the SOP to detail how you're going to do things."

The NSC team also took time to discuss WESS, share operating tips, and go step-by-step through the process to help the command with this reporting tool. Maj. McKegl commented, "The two-way communication was great. The team met our expectations, and it was good to 'learn it as we did it.' The process was extremely effective." He added, "Safety isn't competitive. It's a collective process in a command. The survey offered advice on how to use the safety tool. It's one thing to have the tool, but it's another thing to learn how to use it."

He went on to describe the survey as more of a client-consultant role, adding, "We had a wonderful two-way dialogue and sharing of ideas. The Safety Center guys have the knowledge, experience and different skills to benefit our command. They bring best practices from around the fleet and from hundreds of surveys each year. We're very happy to have had them look at us."

At the outbrief, LtCol. Conrad summed it all up with one simple statement, "Your look gives us a good rudder steer on where we have to go."

For more information on the survey teams and to get their schedule, visit the Naval Safety Center website at www.safetycenter.navy.mil/aviation/checklists/default.htm and www.safetycenter.navy.mil/aviation/surveys.htm.

Mr. Steber is the *Mech* editor, Naval Safety Center.

Aviation Culture Workshop

Dysfunctional organizational cultures lead to practices or habits that can result in mishaps and degraded combat readiness. The culture-workshop (CW) program assists commanding officers by identifying organizational strengths and potential hazards, which often arise from unit culture.

Operational excellence exists on a foundation of trust, integrity and leadership that is created and sustained through effective communication. During the workshop, a trained facilitator directs individual and group discussions to discover underlying culture elements within the command. The commanding officer receives feedback during a frank debrief. Specific results do not leave the squadron. However, the Naval Safety Center uses CO critiques as a process-improvement tool and to provide senior leadership with an list of risks faced by commanding officers.

After the workshop, commanding officers may make hazard assessments and risk decisions, implement controls, and exercise leadership to fine-tune their unit's culture.

To maximize objectivity and ensure confidentiality of the results, the Naval Safety Center carefully selects and trains Navy and Marine Corps active duty and reserve officers (typically O5 or O6) from outside the unit's chain of command as facilitators. Units requesting a culture workshop need to arrange for two additional personnel (typically a lieutenant or company grade officer, and a CPO or staff NCO) from a sister or like unit to assist the facilitator.

The culture workshop is designed to minimize disruption to a unit's daily activities.

In FY07, 105 culture workshops were completed.

All Navy and Marine Corps aviation units are required to complete a culture workshop at least every two years. The completion of this requirement is tracked in the Navy pulse system https://usn-pulse.com/safety/.

Facilitators meet semiannually, and at a recent meeting, they developed a list of generic, recurring organizational culture hazards observed in workshops in FY07.

Here are the top 10 hazards to operational excellence in FY07:

1. Aviation training

- Skill-based errors are increasing.
- Qualified versus proficient: Squadrons provide enough flight time to maintain qualifications, but not enough to maintain proficiency. This problem was most evident in the HSL community.
- Simulators are not a direct replacement for flight time. The fidelity of simulators currently in use is insufficient to directly replace actual flight time.

2. Communication

- One of the toughest issues facing commands. Effective communication programs are readily apparent. Commands with effective organizational cultures make sure that keeping Sailors and Marines informed and engaged is a top priority. So called "busy commands" don't.

- A schism often is observed between the junior officers and the CPOs/SNCOs or the senior petty officers/NCOS and the CPOs/SNCOs.
- Communication techniques that emphasize use of email vs. leadership engagement and interaction often contribute to these schisms. Do not underestimate MBWA (management by walking around).

3. Failure to leverage the sponsor and indoc programs

- An individual's first 72 hours in a command sets the tone for the remainder of their tour. Commands with effective organizational cultures make these programs a priority. "Busy commands" often allow them to atrophy.

4. Failure to leverage anymouse and CO suggestion boxes as hazard-identification tools

- Some commands require a name on submissions to the CO's suggestion box, which may inhibit individuals who might identify hazards.
- Some CO suggestion boxes are checked by the CMC or the sergeant major, giving the perception that the CO is not interested, or, at a minimum, is allowing the inputs to be screened.
- Commands fail to provide consistent and visible feedback to any and all CO suggestion box and anymouse submissions. This leads to the attitude of "Why

bring it up? Nothing will happen."

5. Operational excellence vs. "get the x" mentality

• There is perceived pressure to "get the x." Does the command support pilots and mission commanders when difficult decisions are made?

6. Lack of fidelity to quality-assurance (QA) principles

• Some commands use QA as a dumping ground for individuals with no community experience or lacking the leadership skills necessary to run a shop.

• Facilitators observed many commands where individuals do not want to become CDIs because of the increased workload and added responsibility.

• In many commands, CDIs and maintenance personnel are faced with perceived pressure from maintenance control to get the job done or "we'll find somebody who will."

7. Training

• Increased op tempo is forcing non-OJT training to go by the wayside.

• The lack of computers and NMCI availability hinder performance. A shop with 30 to 40 people, such as the line shack, may have only two computers available. On average, only 10 to 20 percent of E-4 and below in fleet squadrons can check NMCI email daily; yet, much of the information now necessary to be "operationally excellent" is available solely via the net.

• Sailors have to complete Navy Knowledge Online (NKO) requirements at home.

• Sailors routinely say they are being inundated with surveys and NKO-training requirements. How many surveys are enough?

• Marine commands use Marine Online and Marine.net to accomplish many of the same training tasks the Navy does with Navy online. Are the Marines seeing the same issues?

8. Integrity

• What is valued? What is rewarded? What is punished?

• When the command conducts a risk analysis and decisions are made to deviate from the prescribed standards, are these deviations communicated to all levels to mitigate the perception of double standards?

• Is leadership willing to make tough decisions that are the right thing to do but may not be career enhancing?

9. Ineffective use of ORM beyond a superficial level

• Failure to require organizations to communicate in terms of ORM.

• Failure to use ORM to identify and make risk decisions at the appropriate level.

• Failure of the external chain of command to respond to and be accountable for using ORM.

• The safety department and safety officers are ineffective and inconsistent. The safety office is a dumping ground or just a holding pen until one of the major departments opens up.

10. Unwillingness to submit hazreps because of fear of repercussions

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Commanding Officer's Feedback

These top 10 facilitator-identified hazards provide a good overview of feedback from last year. Commanding officer feedback is also important. Shortly after completing a culture workshop, the Safety Center solicits inputs from commanding officers as to what they feel are the biggest hazards they face. This is the FY07 list of CO comments:

- Resource shortfalls and funding
- Personnel shortages and lack of qualified personnel
- Op tempo and IA assignments (affects retention)
- Communications
- Complacency (aircrew and maintenance)
- Aging aircraft
- Personal misconduct (drugs and alcohol)
- PMV and off-duty recreational accidents
- Training

Request a culture workshop online at: www.safetycenter.navy.mil/culture/request.htm.//

POC is Cdr. John Morrison, Naval Safety Center, DSN 564-3520 ext.7212, comm (757) 444-3520 ext. 7212. His email is: john.a.morrison@navy.mil. Additional information is at: www.safetycenter.navy.mil/culture/

Safety-Climate-Assessment Surveys

By Don Lawson

Your unit probably has undergone many changes over the last few months. Perhaps you've had a change of command, deployments, high op tempo, lack of resources, morale concerns, or possibly an on- or off-duty incident or mishap.

Is your unit's safety climate improving, stagnant, or declining under these conditions? Which safety-related issues most concern your personnel? What do they believe are the command's strengths?

Commanding officers know the Naval Safety Center safety surveys and culture workshops provide outstanding assessments of command safety issues, programs and culture. However, only the online safety-climate-assessment surveys (CAS) offer immediate and direct internal feedback from unit personnel. The website (see Figure 1) is an invaluable tool for COs who want anonymous feedback, measurable results, and intervention options.

Survey Options

Most of you are familiar with the command-safety assessment (CSA) and maintenance-climate-assessment survey (MCAS) that have been available online since July 2000. The survey process, based on the high-reliability-organizations (HRO) model, assesses an organization's ability to conduct flight operations and maintenance in terms of leadership, culture, standards, policies, procedures, and practices.

You may not realize, however, that seven additional surveys have been included to measure personnel perceptions of organizational safety climate, as well as off-duty activities. Together, the nine available surveys include:

CSA – command-safety assessment (for aircrew)

MCAS – maintenance-climate-assessment survey (for maintenance personnel)

FRC – fleet readiness center (FRC artisans)

CTR – contractor maintenance (contractors)

HHQ – higher-headquarters-assessment survey (HHQ personnel)

D&D – drinking and driving (all hands)

OD&R – off-duty and recreational-activity safety (all hands)

PMV – private-motor vehicle (all hands)

MTRCYCL – motorcycle-safety assessment (for motorcycle operators and passengers)

Individually, or collectively, these nine safety-climate-assessment surveys provide COs with the ability to quickly identify pertinent human-factor issues and implement intervention strategies before an adverse occurrence. Is your command using these surveys effectively? Many are. To date more than 337,000 surveys have been taken.

Value

These surveys provide unique capabilities and value:

- Response anonymity
- Ease of implementation via the online format (offline version available upon request)
- Worldwide access 24/7
- Surveys immediately available upon request (no advance notification/scheduling needed)
- Personalized service for survey setups, debriefs, and questions
- Unit survey results only provided to CO/OinC (individual access ID protected)
- Internal unit feedback (NSC surveys and culture workshops provide external team reviews)
- Open-ended survey items provide alternative "anymouse" format for additional unit feedback
- Data-sorting options allow prioritization of safety concerns and interventions
- Analytical safety tool (data comparison with

results from unit's and communities)

• Intervention suggestions currently provided for all CSA, MCAS, and FRC survey items

• Website provides opportunity for anyone to suggest additional interventions

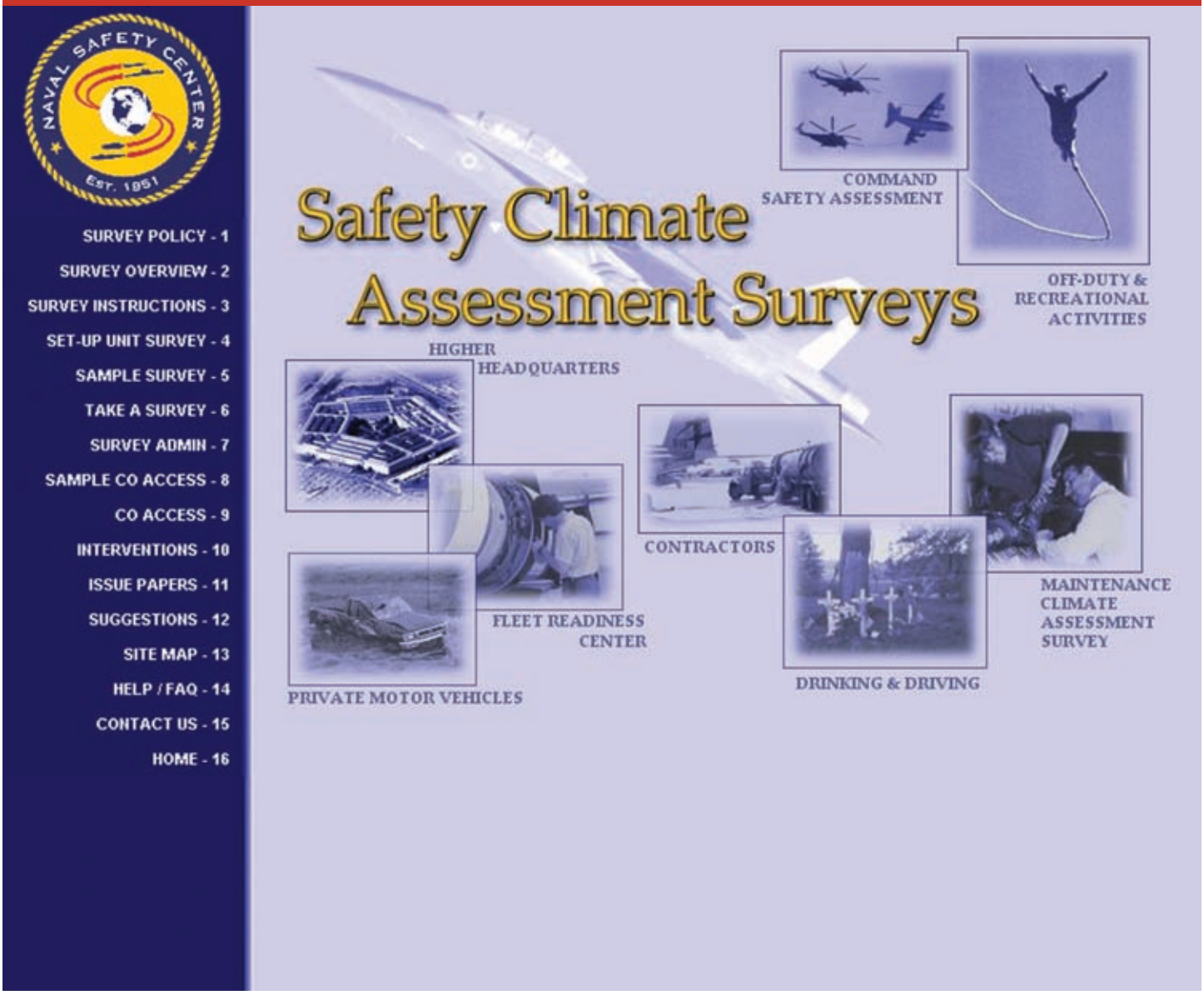
• Higher headquarters may review aggregate results and conduct analysis (unit confidentiality preserved)

Requesting safety-climate-assessment surveys

Commanding officers who want their command to take any of these nine suveys should have their ASOs submit an online request via the secure website: https://www.safetyclimatesurveys.org.

ASOs must provide unit information under the menu option "Set-up Unit Survey–4" and receive survey IDs for immediate use. For higher headquarter passwords, access to issue papers, additional information or questions, contact Dr. Bob Figlock, Don Lawson, or Mike Schimpf at: (888) 603-3170, or via email at surveys@AdvancedSurveyDesign.com.

Figure 1. Safety-Climate-Assessment-Surveys Homepage.



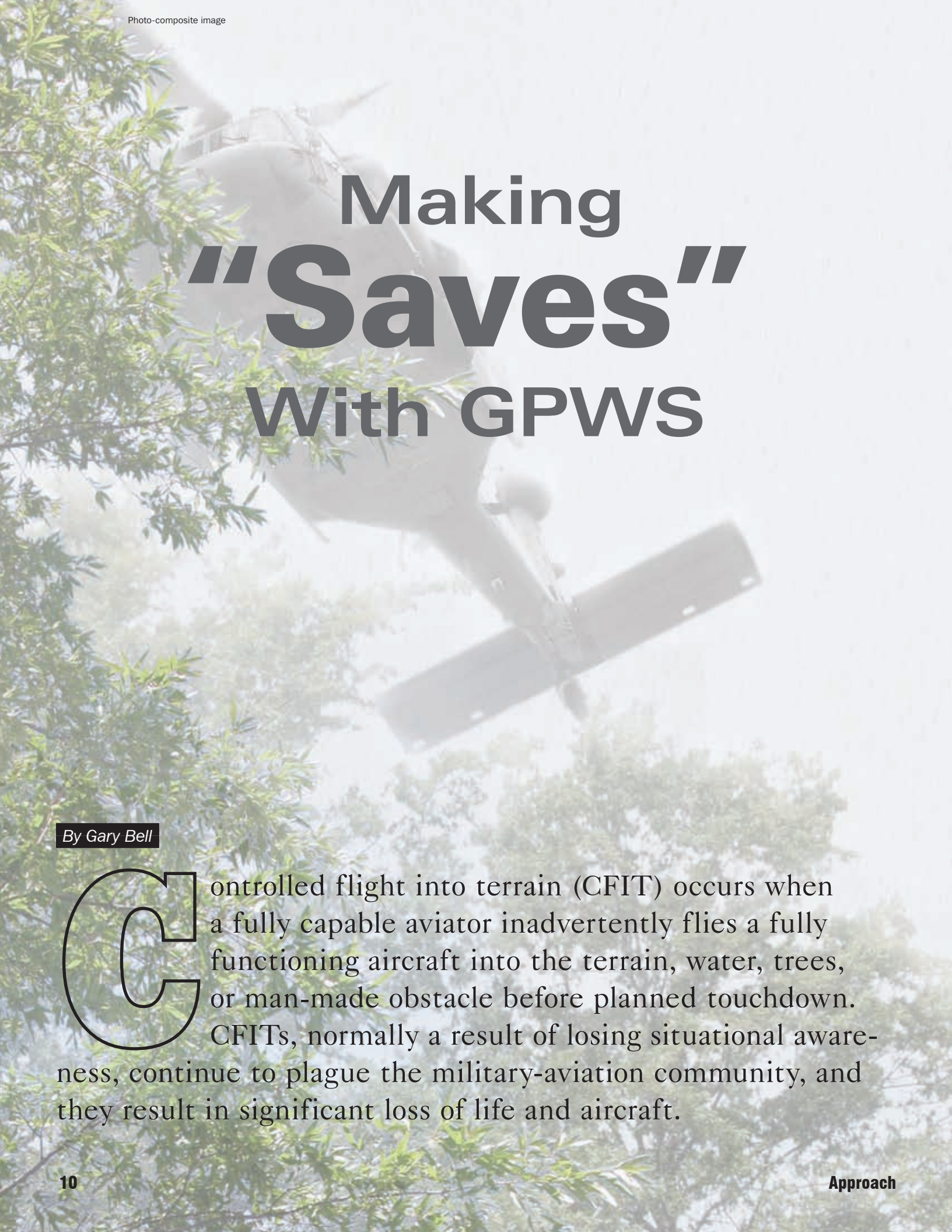


Photo-composite image

Making "Saves" With GPWS

By Gary Bell

Controlled flight into terrain (CFIT) occurs when a fully capable aviator inadvertently flies a fully functioning aircraft into the terrain, water, trees, or man-made obstacle before planned touchdown. CFITs, normally a result of losing situational awareness, continue to plague the military-aviation community, and they result in significant loss of life and aircraft.

CFITs claimed 241 lives and 104 Navy and Marine Corps aircraft, with a cost of more than $1.4 billion.

The Naval Safety Center's mishap data shows that from 1987 through 1996, CFITs claimed 241 lives and 104 Navy and Marine Corps aircraft, with a cost of more than $1.4 billion. While aircraft losses cause a measurable reduction in military readiness, the loss of our shipmates is immeasurable.

The good news is the situation is getting better. From 1997 through 2006, CFITs resulted in 166 lives and 55 aircraft lost. That is a decrease of 31 percent in fatalities and 47 percent in aircraft over the previous 10-year period, despite the increased operations supporting the Global War on Terror. The implementation of a ground-proximity-warning system (GPWS) and terrain-awareness-warning system (TAWS) on Navy and Marine Corps aircraft has been a major contributor to the decrease in CFITs.

GPWS is a survivability system that warns the pilot of imminent CFIT over level terrain and water. The system provides directive aural commands, such as, "Roll right, roll right," and "Pull up, pull up." Also, a visual cue, such as an arrow, appears on the primary flight display.

GPWS is a software algorithm that uses aircraft-sensor inputs—the radalt, air-data computer, and inertial-navigation system—to determine when an impact with the ground or water is imminent. The warning comes in sufficient time to avoid catastrophe. GPWS provides excellent CFIT protection for over water and level terrain, but it cannot "see" ahead of the aircraft and provides no protection in rising or mountainous terrain.

TAWS is a next-generation GPWS, designed to provide the aircrew with a predictive ground-avoidance system. TAWS provides the capabilities of basic GPWS but adds increased coverage in all flight maneuvers in all terrain types, including rising terrain. TAWS provides this information through use of GPS and a digital terrain-elevation database.

As a result of the chief of naval operations mandate to achieve naval-aviation mishap-reduction goals, in 1987, the Naval Air Systems Command (NAVAIR) began to evaluate GPWS and TAWS hardware systems. Honeywell GPWSs were installed on C-130 and KC-130 aircraft, and Honeywell's enhanced GPWS (TAWS) were placed on VP/UP-3 and C-2 aircraft in the late '90s. NAVAIR also began developing the first embedded software GPWS for tactical aircraft, the FA-18, in the early '90s, and it was deployed in 1996.

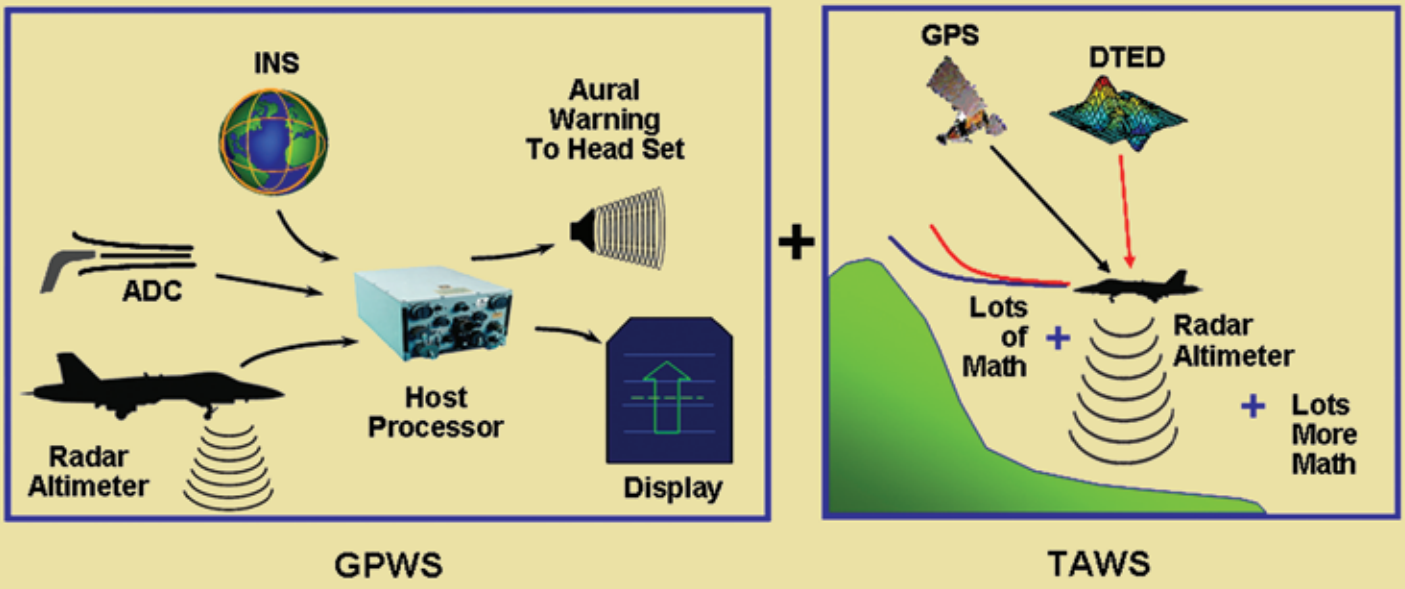
For rotary-wing aircraft (CH-46E, CH-53D, CH-53E and MH-53E), installation of Cubic Defense Systems GPWS began in 1999. The project recently was completed. Initial nuisance-warning problems were fixed with a modified software release and more effective audible and visual warnings. These aircraft now have been credited with several GPWS "saves." The XO of HMH-464, while deployed to Iraq, stated, "The belief and relief that the system is on board the aircraft is reborn in the pilots and crew members of HMH-464. Pilots and crew members are alive today because of this system."

A GPWS "save" was documented in an *Approach* magazine's August 2001 article, "Seeing the Desert at 70 Feet." The FA-18 pilot, flying as chase aircraft, received a GPWS warning and performed a maximum-performance pullout, bottoming out at 420 knots and 70 feet above the terrain. [editor's note, this article is online at: http://www.safetycenter.navy.mil/media/approach/issues/aug01/saved.htm]

The deployment of TAWS in the FA-18 in 2004 was a significant milestone in CFIT protection. The predictive capability of TAWS is generated through use of the digital-terrain-elevation database (DTED) in the digital map.

The TAWS algorithm continuously monitors real-time aircraft position, attitude, and altitude, and calculates the predicted aircraft-recovery flight path.

GPWS/TAWS System Description



TAWS incorporates GPS and a digital terrain database for a forward look capability that provides warnings of vertical terrain.

Developing TAWS for military flight regimes is a fine balancing act, providing CFIT protection during aggressive tactical flight, while keeping nuisance warnings to an absolute minimum.

The nature of tactical-military flight means aircraft intentionally fly in a very demanding and dynamic environment, such as low-level, high-speed, high-G, and high angle-of-bank flight regimes.

The TAWS algorithm is tailored to each platform, taking into account such factors as low-transition takeoffs, low-altitude tactics, transonic flight, autorotation, wingman crossunder, minimum-altitude weapons release, deck-edge crossings and tail strikes, and high sink-rate landings.

Embedded GPWS currently is in all AV-8B and FA-18 aircraft, and TAWS is in all FA-18 aircraft equipped with tactical aircraft moving map capability (TAMMAC). As Navy and Marine Corps aircraft become an all-digital fleet, embedded GPWS and TAWS are being developed for a variety of platforms, including MH-60R, MH-60S, AH-1Z, UH-1Y, CH-53K, MV-22, T-45, and E-2D. The MH-60R and MH-60S are the next out of the chute, with deployment scheduled for 2009.

CFIT is one area in which the Navy is reducing preventable mishaps. Nearly 1,600 aircraft currently have a GPWS or TAWS solution installed. Another 1,800-plus aircraft are slated to get GPWS or TAWS in the next two to seven years.

The Navy's GPWS has several documented "saves" and was deemed as having made a "statistically significant" difference in the FA-18 CFIT rate. The GPWS team won the FAA 2006 Excellence in Aviation Research Award for enhancing the safety of military aircraft. But, we can do more, so the GPWS team continues to look at new technologies in the areas of obstacle detection, brown out, and automatic recoveries.

The GPWS/TAWS team is part of the Air Combat Electronics Program Management Activity (PMA209) of the Naval Air Systems Command. For more information on GPWS/TAWS, email us at: PMA209GPWS@navy.mil.

Mr. Bell is with PMA209, NAVAIR.

Be the First

By Lt. Ryan Hyslop

"Last one to the alternate is the last one to get gas." That is an old saying my father, a former naval aviator and commercial airline pilot with more than 40 years of flying experience, always told me. This adage also would have been a good one to live by as my detachment OinC and I flew our C-2A off the carrier on a forward-logistic-site move day into Souda Bay, Greece.

I was in the left seat, piloting the Greyhound, and my OinC was the aircraft commander, managing the radios and navigation in the right seat. We just had completed distinguished-visitor (DV) ops from Djibouti with one COD and planned to meet the rest of our det in Sigonella, Italy, later that evening.

With a completely packed bird, we launched from the carrier in the southern Red Sea, just east of Eritrea. Our flight plan took us over the Sinai Peninsula, directly over Cairo, and Alexandria, into the southern Mediterranean, and finally to the island of Crete. We determined during preflight planning that we probably would land at Souda with just more than 3,000 pounds of fuel remaining, well above our SOP limit of 2,000 pounds on deck. A quick check of the weather showed the standard clear-and-a-million all the way to the Med and then possibly a shower or two as we hit the east side of Crete. We were told the weather system currently over the island of Crete would move eastward, and the conditions would be much better by the time we arrived. The forecast predicted 2,000-foot ceilings and plenty of visibility.

As predicted, the weather was great all the way to just south of Crete. As we approached the island, we saw some towering cumulus beyond the mountains that span the southern end of the island. At this point, we were about 100 miles south of Souda, with 4,000 pounds of gas—looking good, we thought.

My OinC pulled up the ATIS, and to our dismay, Souda currently was IFR and engulfed in a rainstorm, with visibility at 500 feet and five kilometers (3.1 miles). The time had come to start pulling out the approach charts and briefing the different approaches. We were passed to Athens center and then to Chania approach, who immediately put us in a holding pattern at 7,000 feet directly overhead the Souda field.

We now had entered the goo and were in the middle of a rainstorm with light-to-moderate icing. As is standard with the COD, our deicing boots weren't working, so I became concerned about how long we would remain at altitude. The temperature on deck was in the mid-50s, so I knew if we soon descended, we would be fine.

As we held overhead, waiting on our approach into Souda, we could hear the controller talking with a Swedish Air 757, attempting the VOR-procedure-turn approach into the field. As the Swedish 757 turned short final, we waited for instructions to start our approach. We then heard the Swedish 757 call, "Missed approach," with frustration in his voice. Immediately, the controller announced the field

I became very nervous... the field was zero-zero, and we had about 2,500 pounds of gas.

Photo by PH3 Michael D. Cole. Modified.

at Souda just had gone down to zero-zero in a driving thunderstorm. The Swedish Air 757 requested another attempt at the approach and was vectored to 4,000 feet in holding below us.

I became very nervous. First, the field was zero-zero, and we had about 2,500 pounds of gas. Second, because the Swedish Air was vectored to a lower altitude, I knew they again were going to be sequenced in front of us. Third, the island of Crete is small and isolated. This means that if it is storming on the west side of the island where Souda is, the weather heading east soon will cover the rest of the island.

Athens is the next closest field away from the island, more than 300 miles away. Our primary divert was Iraklion International, which is about 50 miles to the east of Souda, so I asked our OinC to check the ATIS while we were holding. He had been busy coordinating our intentions with approach and working possible approaches. We listened to the ATIS at Iraklion. All the while, the Swedish Air was vectored for its second

approach into Souda Bay. The ATIS at Iraklion reported 1,000 feet and 10K of visibility—just barely VFR, but we had a good divert.

Stop—this is where you go to the alternate. This is where I should have listened to the advice in the title of this article: First to the alternate gets the first gas truck, the first gate, and files the first subsequent flight plan.

Instead, we opted to continue holding and wait for the Swedish Air to clear the approach. Once again, the Swedish 757, with better equipment, a nicer airplane, more experienced pilots, and an instrument panel that has something other than steam gauges to aid in approaches, went missed approach. Somehow, being the cavalier naval aviators we are, we thought we could make the approach, so we began our descent.

Our fuel situation now had become critical. We were below our SOP of 2,000 pounds and had not even begun our approach into a zero-zero field. I reluctantly started the approach and asked for bingo-fuel information from my OinC, so I would have it preloaded for the missed. We took it down to 400-feet AGL as the approach calls for and drove it in for a couple miles. Guess what we saw? "Nothing" is the right answer. We tried to inch down but still had nothing. Finally, with the tower telling us to go missed, I cleaned up and immediately set a bingo profile toward Iraklion, right in the same direction the storm was headed.

We were emergency fuel on direct vectors and a bingo profile to Iraklion. Naturally, the updated ATIS went from VFR to 300 and one-half and thunderstorms. As my OinC scrambled to dig up an approach plate and work the communication drill with Athens Center, I flew my best bingo profile in a thunderstorm, taking on moderate to severe icing, with lightning all around—not the ideal situation. I heard our crew chief begin to prepare all of our passengers (all from our det) in the back for a possible ditching in case we ran out of fuel.

We thought it was as bad as it could get, but to our amazement, our DoD pubs did not have a single published approach into Iraklion. When we combined this information with no radar approach, we had only one option: We had to try and vector VFR over the ocean, below the storm, and drive in over water until we caught sight of the field—a dangerous proposition.

Athens Center passed us to Iraklion Approach, and they vectored us down to 1,000 feet. They said they could not safely vector us any lower, and we were on our own. The field lies right on the ocean, on the northern coast of Crete. Using our multifunction display map, I asked the OinC to drop a waypoint line from the field out to 10 miles over the water, so we could try an internal "ILS." We were in dire straits. Our fuel totaled less than 1,000 pounds, and NATOPS specifically notes that fuel gauging in this realm is largely inaccurate at low levels. We had enough fuel for one approach, and then we were most likely going to flame out. This pass was make or break.

All I could think was, "Here I am, a fleet C-2A pilot with the lives of 20 of my det members in my hands, attempting a completely bogus approach into a field I never have seen before nor have plates for, and I am in a driving thunderstorm, with no gas."

We commenced our internal "ILS," and at about 500 feet and three miles, we saw water for the first time. Shortly thereafter, I caught the field about 30 degrees off centerline at my 11 o'clock, breaking out at roughly 300 feet and one mile. We landed in the driving rainstorm, in pooling water, with roughly 700 pounds of fuel remaining. I am surprised our low-fuel lights did not burn out because they were on so long.

As we taxied into the gate, I noticed my OinC and I visibly were shaken from what ended up being just under a five-hour flight. We parked at the end of the ramp, right next to our friend, the Swedish Air 757, and at the end of a long line of airliners that already had diverted ahead of us.

We waited two hours for fuel and to flight plan the final uneventful leg into Sigonella. As for lessons learned, the title says it all when it comes to weather. We had a chance to divert when it was VFR, but we boxed ourselves into a hideous corner we ultimately were fortunate to emerge from unscathed.

The COD mission is so vastly different than the rest of the air wing that, sometimes, expectations or unrealistic demands are put on the detachment. This mindset forces pilots to make difficult decisions that would be better served with the appropriate tools: radios that consistently work in the international environment. This includes an operable HF radio and good, reliable UHF-VHF radios. In my opinion, COD pilots should be trained and use Jeppesen charts and pubs that accurately depict all available fields in the international environment, and not just those listed by DOD.

Finally, it would have been nice to have an updated aircraft with the ability to use and fly GPS and other types of approaches around the world. This may help prevent or alleviate an impending disaster.

Until then, I know that from now on, I always will try to be the first to the alternate.

Lt. Hyslop flies with VRC-40.

Uninterrupted

By Lt. John C. Petrasanta

April was a transition month for the 2515th Naval Air Ambulance Detachment (NAAD) on Camp Buehring, Kuwait. HSC-21 and HSC-23 were turning over to HSC-25. On April 30, the sun rose above the horizon to reveal a dismal picture: high winds, poor visibility, and lots of sand and dust in the air. The forecast wasn't any better: really high heat, with marginal and unfavorable conditions throughout the day.

This week was the first during which all the alert crews entirely were with HSC-25. Some of the crew members had been in-country longer than others. I was pushing two weeks in-country, with only two familiarization flights and one medevac as a copilot. My copilot had been here four weeks, with only five flights and no medevacs. I had two senior crewmen, each with four flights and no medevacs. My corpsman, who had arrived in-country with me, only had one flight, a functional check flight, and also no medevacs.

The deputy commander, U.S. Naval Forces, U.S. Central Command, had briefly visited the squadron a day earlier. He mentioned how pilots always cancel their missions whenever the weather is unfavorable, with the exception of search and rescue (SAR) and medevac pilots. We were used to flying in weather that was not optimal. HSC-25 stands 24-hour SAR alert on Guam, where the weather seldom is favorable, but for some reason, the admiral's words loomed in my thoughts most of the day.

I was first up for the 15-minute-alert launch. I looked out the window to see a shamal (sandstorm) rolling through the airfield. My skipper and XO stood outside in the storm, trying out their new protective goggles, laughing and joking around. My copilot was sitting next to me and asked if I ever would consider launching in weather like this.

Most of the day was spent running back and forth outside in the heat and sand between the trailers and hangars, trying to get things organized. The temperature was 43 degrees Celsius, and the wind felt like a hot blow dryer when, around 1545, we got the "medevac… medevac… medevac" call over the radio. We had an urgent patient to pick up from another camp situated between us and the level III medical facility. Fortunately, the weather was the best it had looked all day. Metro called the current visibility at 3,200 meters, more than we needed to launch. They also said the weather should stay above our minimum requirements during our flight.

We grabbed the tasking message and were off the deck SVFR (special visual-flight rules) by 1552. Visibility was in and out along the way, anywhere between one-and-a-half and two-and-a-half miles. We remained 250 to 300 feet and stayed in contact with the deck at all times while avoiding known power lines and towers. My copilot did a great job flying while I handled all the controlling agencies, helped navigate, and looked for obstacles with the rest of the crew.

Shortly after takeoff, we noticed one of our navigation systems was not fully aligning, and our weight-on-wheels (WOW) indicator was on. This meant our navigation system would not fully align. We discussed the situation as a crew and decided to continue. Sand blocking the contact of the WOW switch most likely was the cause.

We landed at the camp at 1605 after a little trouble finding the pad. We still were unfamiliar with the area, and the pad is hard to spot. The visibility was better here than anywhere along the route so far: probably close to three miles. While the ambulance was delayed getting to the pad, one aircrewman tried to fix our WOW switch. The corpsman and other aircrewman grabbed the patient. We lifted at 1618, with the WOW switch still not working.

Services

From left: Ltjg. Hector Ubinas, Lt. John Petrasanta, HM2 (AW/NAC) Brad Reinalda, AW1 (AW/NAC) Matthew Royer, and AWCS (AW/NAC) Michael Laczko. Photo by AW2 Noah Vogt.

As we headed to the medical facility, the visibility started to decrease but never was less than one-and-a-half to two miles. We had to keep descending to keep that view, though. We told the facility how many minutes out we were, provided the patient's condition and status, and made a resupply request. We received no response. As we got closer, we tried again. We received a response this time asking, "How many minutes out are you?"

We were roughly five miles out, so I replied, "Two minutes."

Just then, everything went brown: A shamal came out of nowhere and swallowed us up. I asked my copilot how he was doing.

He said, "OK… on instruments," as he properly slowed from 120 knots to about 65 knots.

I said, "You're OK, you got it?"

"Yeah," he responded, but he understandably sounded a little nervous; so was I. We were now at 200 feet and blind.

"Do you want me to take the controls? I have contact

with the ground," I said.

"Sure, if you want to," he replied.

I took the controls, and as soon as I did, I unloaded some profanity, quickly followed by, "I lost the ground!"

Instantly, we had zero visibility. After patches of contact with the ground, I slightly slid and descended to try and maintain ground contact.

"Look for towers. Look for towers and wires," I said.

The crewmen were rightfully uncomfortable. An aircrewman anxiously asked, "The ball is out… what's our altitude?"

"Sorry, sliding so I can see… 100 feet," I replied, and added, "resetting decision height to 50 feet."

The copilot reset his to 40 feet. The flight profile was slightly erratic because the ground kept disappearing from sight.

"Should we just turn out?" I asked the crew, as I started to turn right to fly out and away.

"There's the national reserve (indicated by a tree with a cage around it)," the senior aircrewman exclaimed. "Come left, come left." I started to come back around to the left.

"We're condition red here [visibility less than 399 meters]… you're coming in?" an excited voice asked over the radio.

"Yes," I replied, as we continued.

Both pilots scanned inside and out, making sure we maintained control of the aircraft, while trying to navigate and avoid obstacles. The crewmen all were scanning up and out to avoid obstacles, and straight down to find the ground.

Our alternative would have been to turn out the way we had come in to get back to VMC, or to climb and pick up an IFR clearance to get an approach back into somewhere else. That plan is the standard for inadvertent IMC, which we were, but our situation was unique, not standard. Another option would have been to land in the sand at our current position and wait out the weather.

Racing through my mind was that we had a GPS waypoint to find the pad—we were right there—and we had an urgent patient in the back who wouldn't receive treatment if we diverted or landed at our current position. Even with trying to turn away, we may not have found a way out of the unpredictable storm. I also knew we were new to the area, so our situational awareness was not the highest. We knew the towers located just off the pad to the south would be difficult or impossible to see. We would have to find the west border of the base and follow it around to be sure to avoid them if we continued. Our ICS was busy with recommendations and safety calls by all crew members; everyone strained to see anything. We decided to continue.

As the ground came into sight, we saw a shepherd with his sheep. We found it amusing to think of his perspective: He's blind in a shamal, and a thunderous sound approaches, quickly followed by the sight of a low-flying machine directly over him that then instantly disappears. Finally, we saw a road and a berm and followed them. When we started to make out several visual cues, we knew we were near the pad. Then, there it was. We were on final.

At 1640, 10 minutes after the two-minutes-out call, we were safe on deck, delivering our patient. We shut down with no plans of leaving until the visibility improved. After several calls back and forth to base, everyone decided it was best just to stay the night. It had been only two days since I had been released from the same facility for a prior illness. The staff of the Expeditionary Medical Facility (EMF), Kuwait, that had treated me so well while in their care, joked about my wanting to return to stay another night. The staff went out of their way to help us, providing undergarments, shower shoes, towels, toiletries, and a place to stay the night.

The next day, after the return home, we had a long debrief. We concluded that our course of action had been the best decision we could have made. We also agreed that had we been farther out from the medical facility, we would not have continued. I was extremely pleased with how my crew responded to the crisis but not surprised. I know I can rely on them. This flight was the epitome of good crew resource management. The crew had put themselves at great risk for the welfare of another.

At the 2515th, we still are refining our SOP and ironing out practices and procedures to optimize our resources. We want to run the squadron as effectively and efficiently as possible to save the lives of others—even in the mayhem of a turnover and the chaos that ensues.

Lt. Petrasanta flies with 2515th NAAD.

Crew Resource Management

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

CRM Contacts:

CRM Instructional Model Manager
NASC Pensacola, Fla.
(850) 452-2088 (DSN 922)
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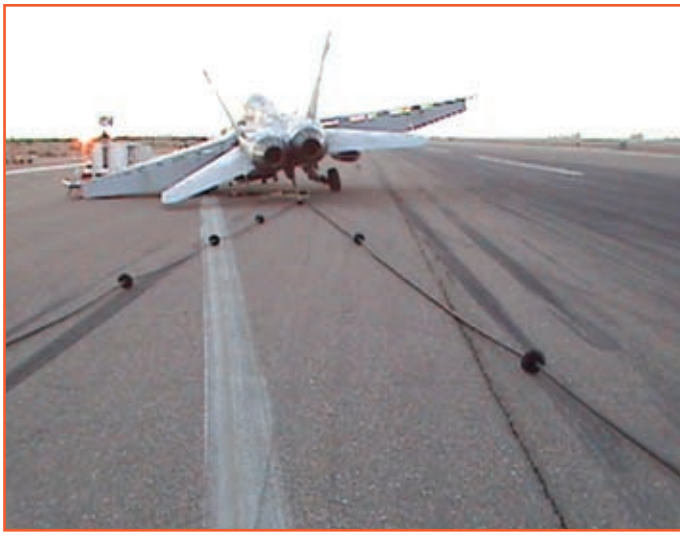
It's Not Over 'Til It's Over

By Capt. Joseph R. Coenen, USMC and Maj. Alvin L. Bryant, USMC

If you've flown out of NAF El Centro, Calif., you know how hard it can be to find entertainment. This problem is typically solved by traveling "over the hill" to San Diego. However, this August night was different; my WSO and I got all the excitement we could handle right there at the field.

We were Dash 2 on a night division, self-escort, strike-training mission midway through a six-week detachment. We planned to fight our way through bandits in the training area and drop four simulated JDAM into the MAWTS-1 building in Yuma. I looked forward to having a good flight, a quick debrief, and grabbing a cold beverage with my buddies at the club to end the night.



Our division took off at 2100 and checked into the training area. The tactical portion of our mission went well: We fought our way in with no blue losses, destroyed MAWTS-1, and fought through several more bandits on our way out.

We flowed east, regrouped, and went in for another run. After completing our training, we fenced out and headed back to El Centro.

During the 15-minute transit back to the field, my WSO and I discussed the flight and made small talk to pass the time. Not that I had "dropped my pack," but I definitely wasn't anticipating any problems from this point on. As it turned out, just when I thought the flight was coming to an end, the fun was about to begin.

We came in for a standard overhead approach to runway 8. I broke four seconds after lead. I was two-thirds through my turn, as I watched airspeed drop below 250 knots. As I put down the gear and the flaps to full, I kept an eye on lead.

When I came back inside the cockpit to do the landing checklist, my WSO said, "It would be nice if all of our gear would come down."

I initially thought the bulb had burned out when I only saw two landing-gear lights illuminated—the nose and right main. My heart rate went up a bit when I recognized the gear-warning tone and the red light in the gear handle.

After lead confirmed his clearance to land, we alerted tower and base that we were entering the delta pattern to troubleshoot a gear issue.

We pulled out our pocket checklists, and Dash 3 said he would join to visually inspect our gear. Aircrew gathered in the ready room as lead and Dash 4 landed. Everyone was on tower or base frequency to offer further assistance if we needed it.

My WSO and I quickly completed the first few steps of the NATOPS "landing gear unsafe/fails to extend" procedure and waited for Dash 3 to join. I turned down my position-and-form lights so he could get a good look at us with his night-vision goggles

It wasn't until the emergency-gear-extension procedures, and some positive and negative Gs failed to extend the gear, that I started to get nervous.

(NVGs). He confirmed what we already suspected: Our left main-landing gear was not extended fully.

He said, "It looks like two of the gear doors are jammed together, keeping the gear from dropping any more than about six inches."

It wasn't until the emergency-gear-extension procedures, and some positive and negative Gs failed to extend the gear, that I started to get nervous. Despite our repeated efforts, the gear wouldn't cooperate, so we began to review our options. The plan we put together was to fly a straight-in to runway 8, with a minimum-descent-rate arrested landing. We figured we had enough gas for two shots at the wire, so we could take the first pass around if necessary. We confirmed the arresting gear was in battery and checked its location in relation to the ball. With just less than 1,200 pounds of fuel left, we headed toward the initial-approach fix (Slammer) to set up our straight-in.

Our pucker factor increased following a fuel-hot caution and a subsequent AMAD (airframe-mounted-accessory drive) caution. We reviewed procedures for that caution as I turned final. We decided to make a half-flap approach in case we developed engine trouble.

Not recognizing the snakes we were fighting in the cockpit, tower chimed in to offer assistance.

"Hawk 82, tower. Would you like to delay approximately five minutes for LSO assistance?" We declined their offer because of our fuel state and the compound emergencies.

As we made our way down glide path, I couldn't help noticing the many crash-and-rescue vehicles surrounding the landing area. Seeing those trucks, I recalled the many mishap videos I'd seen during my short career. The trucks would have been good motivation to make a good landing, had I needed any.

As we approached the runway, I fine-tuned the lineup and added power to cushion our landing. I touched down just before the cable as softly as I could and applied right stick to keep the left wingtip off the deck as long as possible. As we passed the arresting gear, I didn't feel any deceleration, but I did hear the best radio transmission of my life.

"Good trap! Good trap!" was shouted on tower's frequency, just as I added power to go around and try again.

"Thank God," I thought as the cable slowed us down. The jet leaned on our left fuel tank, as we slid a couple hundred feet down the runway. We finally ground to a halt about 30 feet left of centerline.

Fire trucks raced toward us as we sat in silence for a few seconds. I shut down the motors, and lacking the brain power to say something clever, I asked my WSO, "You ready to get out?" He affirmed with relief in his voice, so we hopped out and inspected the jet.

To our surprise, there wasn't much damage beyond the left gear doors and fuel tank. The only other damage was to the CATM-9M attached to our left wingtip. Because we had been flying with two external fuel tanks, called double-bubble, the left aileron missed scraping the deck by less than an inch.

After the investigation, we learned a fatigued hinge assembly on the landing-gear door had failed as we put down the gear. That gear door, once lowered into the air stream, swung under the left main-landing gear and slammed into the gear door on the opposite side. With the two gear doors wedged together, the landing gear couldn't create enough force to pull them apart. It's amazing how a $1.90 part can create huge problems for a multi-million-dollar aircraft. Maintenance replaced the damaged parts, nobody was hurt, and the jet was flying again before the det was over.

That flight was a good example of what can happen during the "admin" phase. It's easy to forget the flight isn't over when the target is destroyed and you're on your way home. Thanks to crew coordination in the jet and support on the radio, the only negative consequence of our late night slide was giving mishap statements and blood samples, while the rest of the Hawks enjoyed Wednesday night at the El Centro O'club.

Capt. Coenen and Maj. Bryant fly with VMFA(AW)-533.

Pushing the Limits of ORM:

The Cross-Country That Took an Extra Week

By Maj. Jesse Janay, USMC

It wasn't a CAVU day, but we had 1000/3 to launch on our four-day, cross-country from New River, N.C. to Yuma, Ariz. Our squadron planned to launch six AH-1Ws and four UH-1Ns on a ferry flight for the fall WTI (weapons-tactics-instructor) class. Our section was the "tail end charlie" with the maintenance detachment and parts. Everyone else had launched a day earlier, and we were gearing up to go.

As we prepped to launch, a flurry of activity surrounded our aircraft, and everyone felt a perceived pressure to launch. I recognized this pressure and wondered, "What's the hurry? Is someone's life in danger?" Once I realized it was a self-induced stress and critical items possibly could be skipped, I told everyone to stop, take a breath, and proceed in a safe, expeditious manner. We launched without a hitch.

As we pushed westward to our first stop, the weather didn't develop as forecasted. The conditions had dropped to 500/1, and we recognized the hazards of IMC, low altitude, and obstacles. We slowed down to mitigate the risks and called out all towers. We also just had passed a small civilian airport and identified it as a divert option, in case conditions worsened. As we pressed on, though, the weather improved. The next two days through Nashville, San Antonio, and Midland went without a hiccup, except for an engine chip light on deck at Knoxville (it just was fuzz).

On day four's first leg, from Midland to Las Cruces, our aircraft decided it didn't want to fly anymore. As we crossed the vast expanses of nothingness in central Texas, a torque split that was within limits went out of limits. Within one minute after we recognized, troubleshot, and discussed our plan, the combining-gearbox-pressure gauge fluctuated 30 to 40 psi and out of limits. We had rough terrain off the nose, so I turned away from it, and my co-pilot broke out the pocket NATOPS—there are no immediate action items. While troubleshooting the emergency, I told lead we had a problem and requested a steer to the closest airport. NATOPS states this was a "land as soon as possible" emergency, which is defined as "the first site at which a safe landing can be made." Well, there were no roads, no houses—nothing in sight.

Our emergency had no secondaries, and I thought about that small quote at the beginning of the NATOPS, "… it (NATOPS) is not a substitute for sound judgment… available facilities… adverse terrain… may require modification of the procedures contained herein."

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The first steer from lead was Dell City airport at 46 miles, which is in the middle of nowhere. We didn't know what services or support they could provide. The second steer was for Pecos Airport at 47 miles—only one more mile for an airport that we knew had gas and services, and that we were familiar with. I made the call for Pecos, and we pressed. We later found out that Dell City had nothing: no gas and no support.

Back to the land-as-soon-as-possible situation. Did we want to land in the middle of the Texas desert, with no roads to help a maintenance recovery? My answer was "no." We did everything to mitigate the risks and implement controls. We slowed to 80 knots to reduce the stress on the drivetrain and to cool the c-box temperature. We

Photo courtesy of Capt. L. D. Byrd, USMC.

also lowered our altitude to 200 feet AGL (in case we had to get to the deck fast) and maintained an autorotational profile (in case things got ugly fast). Finally, we took the tac-lead, so we didn't have to fly form off of them (but we told them to take the comms).

To control the risk, we decided if we got any secondaries, we immediately would land the aircraft. I discussed this plan with all my crew and asked if it exceeded anyone's comfort level.

We made it safe-on-deck to Pecos and were there for five days. Corpus Christi and Pensacola primary flight students are familiar with Pecos, more specifically, the burritos they give you while you fuel. Just for everyone out there that may possibly break down in Pecos, it is not a good "libo-spot," but the people of Pecos are wonderful and extremely helpful. We just didn't have as much fun as the Cobra crew that got stuck in San Antonio for a week because of a bird strike on their tail rotor.

Instead of going into every gory detail of those five days, I'll just list some of the things that broke and got fixed: a c-box cannon plug, an Nf governor, two tail-rotor servos, an oil-cooler-blower seal, a leaky aux-fuel bag line, and a battery. As soon as we fixed one thing, something else broke. I really think our bird just wanted to stay in Pecos.

We had human-factor issues to deal with, too. Because this cross-country was lasting much longer than we had expected, it looked like my crew chief might miss his wife's promotion ceremony at work, and my AO perhaps was going to miss his wife's 3-D sonogram of their first child. So, as we went through the maintenance and testing, the pressure of "get-home-itis" was in the back of our minds. How do you mitigate that? Just recognize it, and remember that problems ignored can kill you in this business.

On day five, we tested the aircraft. The torque split was within limits, and we launched to Las Cruces. En route, the torque split got worse and again was way out of limits, which made the landing approach much more interesting. We were stuck in Las Cruces for two days, and lead had to continue to Yuma to make the WTI class in time. After troubleshooting, we found the automatic-fuel-control unit and fuel pump had begun to fail. We speculated if we had ignored it and pressed, the engine slowly would have spun down and flamed out from fuel starvation. We would have had to make a forced landing in the desert in the middle of nowhere because of the high DA (density altitude) of 7,500 feet, high aircraft weight, and inability to maintain single-engine level flight.

Once our aircraft was fixed, we launched out single-ship to Tucson and Yuma. To mitigate the risk of flying without a dash 2 (weather brief), we changed our flight route to IFR ("I Follow Roads'), so if we had to make an unscheduled landing en route, at least we could flag down a car. Fortunately, the aircraft now was a sweet machine and probably the best flier for the WTI class; we had worked out all the kinks. Our last two legs were uneventful, and we all happily flew back to the East Coast the day after we landed in Yuma, on commercial air.

The take-away from this 11-day journey across our vast nation is that ORM isn't just the risk-assessment worksheet (RAW) you fill out before flying. It's an integral and dynamic part of the entire mission—all the way until the rotor stops turning. It's finding out what can reach up and bite you (1. identifying the hazards), figuring out how badly it can bite you (2. assessing the hazards), deciding if the risk is worth it (3. make risk decisions), setting boundaries and go/no-goes (4. implementing controls), and finally, making sure it's going as planned (5. supervise). Did we push the limits? There were many times I just wanted to call the aircraft "good" and get my bird and crew to Yuma, but I didn't. The tool of ORM was an excellent guide.

Maj. Janay flies with HML/A-167.

BRAVO Zulu

HT-28

From left to right, Ens. Daniel Moran, 1stLt. Thomas Hutson, USMC, and Lt. Ted Lemerande. Photo by Lt. Nicholas Malokofsky.

Lt. Ted Lemerande held a morning brief with his students, Ens. Daniel Moran and 1stLt. Thomas Hutson, USMC, for a day VFR, basic-instrument-training flight. The weather was perfect for flying: a little chilly, unlimited ceilings and visibility, with high power margins because of the very low density altitude. The crew had prepositioned the TH-57C at Pensacola Regional Airport to facilitate their Saturday flight.

After the brief, preflight, and startup, the crew was cleared for takeoff from taxiway bravo, parallel to the active runway. They were to remain 500 feet or below and stay north of runway 8/26 for landing and departing traffic.

The transition to forward flight was smooth, but upon reaching 500 feet AGL, the aircrew heard a loud noise from the engine. A strong shudder went throughout the airframe. They felt a mild left yaw, which is indicative of a complete engine failure. Lt. Lemerande's quick reflex action to keep the aircraft in balanced flight made the yaw movement barely noticeable.

Lt. Lemerande initiated NATOPS procedures for an engine failure. He entered an autorotation, while immediately banking hard right toward the runway. He intended to make a 90-degree turn and complete the autorotation to the runway or tarmac of the Pensacola Navy Flying Club. During the turn, 1stLt. Huston removed his instrument training hood to back up the instructor pilot by scanning the gauges for aggravating indications. Ens. Moran, in the back seat, called the turn clear to the right.

During the turn, Lt. Lemerande saw a passenger jet on takeoff from runway 08. He immediately wrapped up the turn even tighter to continue for 180 degrees and instead headed for the parallel taxiway. He chose to land with a tailwind, rather than precipitate a midair collision.

Lt. Lemerande fought to keep the aircraft skids pointed in the direction of the slide to keep from rolling over on landing. He smoothly brought the aircraft to a stop and remained on the paved surface of the taxiway.

The crew evacuated the aircraft and met, as briefed, at a safe distance at the 12 o'clock position from the aircraft nose and waited for the crash trucks to arrive.

The crew had faced a disastrous set of circumstances: an engine failure at 500 feet in a single-engine helicopter with a full bag of gas, and the nearest available landing site 180 degrees to the rear. Outstanding piloting skills, CRM, and situational awareness resulted in a nearly flawless autorotation and uneventful landing.

HSL-49

From left, LCdr. Stan Fisher, AW2 Travis Parker, LCdr. Ron Finch.

LCdr. Ron Finch (maintenance officer), LCdr. Stan Fisher (safety officer), and AW2 Travis Parker were conducting a post-PMI, functional check flight on Red Stinger 103. The last procedure of the day was a routine, in-flight, overwater, fuel-dump check.

The dump pump worked as expected, but when the switch was secured, the fuel valve did not close. LCdr. Finch smelled fuel even after the switch was secured. This smell alerted the crew that fuel continued to dump, only at a much slower rate than during the check. LCdr. Fisher pulled the associated circuit breakers per NATOPS, but the fuel continued to stream out of the aircraft. The dump rate slowed from about 800 pounds per minute to between 300 to 400 pounds per minute because the pump had been secured, and gravity had taken over.

Noting their fuel remaining (2,600 pounds), the current dump rate, and the distance from NAS North Island, the crew discussed their options. Because of Class B airspace and environmental restrictions, they were about 15 miles from shore. Realizing they would not make it to the beach, they began to prepare for a planned ditch. LCdr. Fisher then saw USS *McClusky* (FFG-41), and called for a turn toward the ship. LCdr. Finch called NAS North Island tower, declared an emergency, and told them about the situation. LCdr. Fisher contacted the ship on bridge-to-bridge CH 16, and requested emergency flight quarters. The ship was ready within two minutes.

With streaming fuel, LCdr. Finch landed on *McClusky* with 900 pounds of fuel remaining. Even after shutdown, fuel continued to drain out the dump valve until it reached a level below the dump-valve opening in the fuel tank.

This Buno has an older fuel-dump system that requires power to close the valve when dumping. Post-flight investigation revealed the wire that supplied power to close the valve was broken.

The crew exercised outstanding crew-resource management during this emergency. However, without the rapid reaction, flexibility and professionalism of *McClusky's* flight-deck crew, the aircrew would have been forced to ditch because of fuel starvation.

The SH-60B community never has had an emergency exactly like this, other than in the simulator. Realizing that NATOPS procedures did not eliminate the extremis situation, the crew effectively communicated and chose a different course of action to get the aircraft on the deck. Skillful decision-making and adaptability to the current conditions in the aircraft and on the flight deck saved an aircraft and possibly the lives of three naval aviators.

HSL-51

From left AM2 Ian Siders and AW2 Adam Wuest.

During a night, hot-refueling evolution on board USS *McCampbell* (DDG-85), AW2 Adam Wuest discovered a stream of fluid leaking from Warlord 716's tail-pylon-fold hinge. Petty Officer Wuest quickly told the aircraft commander, who immediately acted to avoid a hazardous situation. After shutdown, AM2 Ian Siders, the detachment lead AM, did an indepth inspection and discovered a hairline crack in the No. 1 tail-rotor-servo-hydraulic line. AW2 Wuest's dedication and keen attention to detail during a routine hot-refueling evolution prevented the possible loss of aircraft and crew.

HT-28

Ens. Jason Patterson, USN, and Lt. Jack Souders, USCG, were returning to NAS Whiting Field after their first solo flight. With only 21 hours of instruction in the TH-57 Bell 206 JetRanger under their belts, both students were lighthearted and feeling a sense of accomplishment with homefield in sight. Unfortunately for the dual solo, they would not be landing at South Whiting Field that day.

Just three miles south of their destination, at 900 feet MSL, the airframe fuel-filter-caution light came on. This light indicates an impending bypass of the airframe fuel filter and the possibility of contaminants in the fuel line. Both students fully understood the implications associated with a clogged fuel nozzle on the single-engine TH-57B.

Rather than trying to fly the three miles to homefield over pine trees and power lines, they prudently followed the NATOPS procedure of "land as soon as possible." They selected the most suitable site, an empty development under construction (no houses or power lines), with newly paved roads and a large cul-de-sac. Ens. Patterson stayed on the controls and entered a turn for a right base to the selected spot. Lt. Souders squawked 7700, declared an emergency to South Whiting Field tower, and broke out the pocket checklist.

The dual-solo crew landed, shut down, and returned to homefield in the recovery truck with a great story. Sound NATOPS knowledge of systems and emergency procedures, combined with solid CRM and skilled airwork, ensured a successful ending to this solo flight.

Left to right, Lt. Jack Souders and Ens. Jason Patterson.

No Flaps, No Slats, No Problem

By LCdr. Chris Dobson

This is the story of a very strange flight—one that we thought only could happen in the simulator. Operating off the coast of Guam under blue-water flight rules, our Prowler crew found ourselves in a multiple-emergency scenario that culminated in a no-flap, no-slat approach to the ship.

It was our first day out after a port visit to Guam. USS *Kitty Hawk* (CV-63) and CVW-5 started a light flight schedule for unit-level training and preparations for CV night currency. We were scheduled for a late-afternoon surface-search-coordination (SSC) mission.

The brief was straightforward, but because this was our first flight out of port, we spent extra time on boat emergencies. When briefing "emergency recovery considerations," I usually don't get too involved with all the possibilities. But, I will remind the crew to coordinate with the ship, and not to take any irreversible actions (dumping fuel or blowing down the gear) until everyone understands the game plan for getting us aboard. I carry a kneeboard version of our type-wing, SOP emergency-recovery matrix, and I usually refer to it when coordinating with a tower or CATCC rep.

We enjoyed a beautiful June day in the tropics. We had case I weather with a few scattered cloud layers. We launched, and I scanned the integrated position indicator (IPI) from my seat as ECMO 1. The pilot raised the gear, and we had three up and locked. We completed our clearing turn, as we accelerated past 185 knots.

"Flaps and slats," was the next thing I heard. I glanced outside to watch the slats start to move up the starboard wing's leading edge. The slats stayed down, and I didn't hear the pilot say, "moving left," so I thought there was a delay in moving the flap lever. I looked at the IPI, and to my surprise, I saw the flaps briefly barberpoled, with the horizontal stab already shifted to the clean configuration, then the flaps indicated up. The slats however, still indicated out.

The pilot told the backseaters that we had a problem with the slats. He immediately reduced power to keep us below the 250-knot-airspeed limit for extended slats. A quick scan of instruments and circuit breakers revealed no other problems, and we decided to troubleshoot while overhead the ship.

I explained our problem to the tower rep and told him our intention was to troubleshoot overhead and recover at our normal time. As we passed 9,000 feet, on our way to 14,000, the slats started moving up the

tracks under normal hydraulic power. The pilot and I looked at each other in bewilderment, and then I double-checked the IPI. The slats indicated full up, and the pilot isolated the combined secondary hydraulic system. We now were flying, for all intents and purposes, a good airplane.

I don't think things magically just fix themselves, so I broke out the NATOPS PCL and looked up the "Flaps/Slats Fail to Retract" checklist. This checklist outlines ways to get the slats and flaps retracted if operational necessity dictates, but otherwise recommends landing as soon as practical, using the "Flaps/Slats Fail to Extend (Failure Other than Hydraulic)" checklist.

While we circled overhead mother at 14,000 feet, I flipped to the emergency-landing checklist to put together a game plan for the approach. I then sensed a pressure change inside my ears and sinuses. I stopped what I was doing and asked the pilot to read the cabin-pressure gauge at his feet. He said, "Climbing through 13."

I immediately placed my hand next to the air vent; I barely felt any air flow. I asked the crew to recheck their circuit breakers, while I scanned the environmental-control switches to see if anything was misplaced. Again, the breakers were in, with the switches in the proper positions. I tried cycling the cockpit air-conditioning switch and held the temperature control to full cold. I got some air, but it wasn't enough to keep the cabin pressurized.

I held off looking for the landing checklist and instead went to the "Cabin Pressurization Failure" checklist. We complied with the checklist, checked the appropriate circuit breakers, and worked the environmental controls, but to no avail. "No big deal," we thought, "we'll just have to debrief maintenance on this one when we get back."

Returning to the task at hand, I read through the "Flaps/Slats Fail to Extend (Failure Other than Hydraulic)" checklist. With our refresher of the flaps and slats system complete, we decided on a game plan to make our approach to the ship. We kept in mind the potential problem of the slats not coming down when actuated. We would make a precautionary straight-in approach to the ship and dirty-up at eight miles.

If the slats failed to extend and everything else came down, we would pull the emergency-flap-motor circuit breaker and try to electrically lower the slats, while keeping the flaps at 20 degrees. Once they were out, we would turn off the emergency flaps/slats switch and reset the electric-flap-motor circuit breaker. If that

didn't work, we would ask the ship to take us aboard in a flaps-down/slats-up configuration or send us to Guam. The flaps-down/slats-up configuration is a big deal for the EA-6B, because, in a bolter or waveoff, the pilot must concentrate on not overrotating the nose, or else the aircraft quickly will enter the stall regime. At no time did I consider the possibility of a no-flap/no-slat approach to the ship; I thought there was no way *Kitty Hawk* would make 40-plus knots of wind over the deck. All the crew members discussed this plan and agreed with it.

Armed with our approach plan firmly in place, we had about 40 minutes left in our short one-hour cycle. We still had a lot of gas onboard. With a normally configured airplane and an isolated combined-secondary system, we proceeded on mission to scout for surface contacts. Raging around in the lower levels of the atmosphere, we burned JP-5 in short order, as we found a couple of ships in the search area. Time caught up with us, and it was time to go home.

We checked in through marshal and asked tower for the Case I recovery. I asked the Boss for my rep and was a little surprised to hear one of our newer ECMOs on the other end of the radio—not a big deal, though. I briefed him on our plan and asked him to relay the possible contingencies to the Air Boss. He did so, and we were directed to hold in the "bullpen," a Case I hurt-bird pattern 10 miles aft of the ship. The Boss wanted to bring us in last, so we hung out for a while and waited for our "Charlie" call.

When this call came, we lined up inside of 10 miles and headed inbound. At eight miles, the moment of truth was upon us, and the pilot called for gear and flaps. A wave of relief swept over me, as I watched the slats start to move down on the starboard side.

"Moving right," I called out, immediately followed by a "moving left" from my pilot.

My next order of business was to come inside and scan the IPI for the horizontal stabilizer to shift to extended throws. This action should happen fairly quickly. My heart sank as I watched the flaps indicate 20 degrees, the slats click over to the out position, and the stab remain clean.

"The stab is clean… power," I said as the pilot pushed up the throttles to keep us over 200 knots. "You have got to be kidding me—this wasn't part of the plan," I thought.

I told tower we had a new problem and needed a couple of minutes to troubleshoot. I broke out my checklist for the second time. The "Stab Fails to Shift" checklist has one boldface step to start off, and that was to maintain 200-knots indicated airspeed. Reading through the checklist at the speed of heat, I surmised the only option left was to shift the stab, using our assist-spin-recovery (ASR) switch, or execute a no-flap/no-slat approach. I asked the backseaters to look up bingo numbers for a divert to Guam, as we climbed to 5,000 feet for the emergency-stab-shift attempt. The ASR switch was sure to work. Even with the flaps down, the system would break the stab-shift cable to allow the mechanical stops to relax to the extended-throws position. Plus, it was powered by a backup battery if we ever had to use it during an electrical failure.

When we reached 5,000 feet, the pilot said, "ASR is coming on." I expected to see the IPI indicate a shifted stabilizer and feel a mild pitch up in nose attitude—nothing happened, though.

I asked the pilot to recycle the ASR switch and for everyone to recheck the circuit breakers. The electrical system operated as advertised, but our spin-recovery system seemed to be out to lunch. I couldn't believe it. Either the stab was really shifted, or we had a lot of other things going wrong. The checklist stated that if the ASR did not shift the stab, make a no-flap/no-slat approach. Tower asked the pilot if he felt like the stab had shifted. The pilot was certain the stab was clean, although none of us really knew what a shifted stab felt like, and we certainly didn't feel like becoming test pilots. We told tower we were committed to a no-flap/no-slat approach and awaited the order to divert to the 11,000-foot-long runways of Andersen AB, Guam.

Boss asked us to standby, as we circled overhead the ship. We checked our fuel state. We were about 120 miles to the divert, and we calculated our bingo fuel at 3,700 pounds. Our state was 4,300 pounds. We thought we should raise the gear to conserve gas, so the pilot made a very careful level-speed change and went gear-up.

The Boss asked us what state we needed to get down to a gross weight of 41,000 pounds. My weight-on-butt switch firmly was depressed, but I quickly ran the math through my pea-sized brain and replied, "4.0."

Boss said, "Roger, notify us when you have adjusted to 4.0 and are ready to make your attempt."

My heart sank as I watched the flaps indicate 20 degrees, the slats click over to the out position, and the stab remain clean.

Our attempt? There only could be one attempt he was talking about.

"Sir, understand you intend for us to recover no flap/no slat?"

"That's affirmative. The ship is currently making 41 knots of wind over the deck. Understand your approach speed is going to be about 166?" said the Boss.

Once again, I did a little math. If I remembered to look up the no-flap/no-slat recovery item in the wing SOP matrix on my kneeboard card, it would tell me precisely that speed—with a gross weight of 41,000 pounds. But I calculated the speed the old fashioned way and double-checked the number with the crew, who all agreed.

"That's right sir, we'll be coming in at 166 knots," I replied.

"Roger that, you have a ready deck. Report a three-mile final," he said.

OK, at least I didn't have to pull the PCL out for a third time. It still was sitting in my lap. I proceeded to find the "No Flap/No Slat Approach" checklist. We cleaned up, and the pilot maneuvered the aircraft to intercept a four-mile final. Oh yes, the slats came up this time, which was a possibility I long had forgotten about. If they hadn't come up, we would have had a whole new set of plans to think about.

We lowered the gear and reported the three-mile final, along with a report we would be bingo on the ball. The Boss was way ahead of us and already had a tanker hawking us on approach. However, I don't think the intention of the tanker was to provide gas for a divert, but rather provide more looks at the ball if we went around for some reason. Paddles came up on frequency and confirmed our configuration, followed with a winds call of 41 knots axial.

Coming down the chute with landing checks complete, we called the ball with a fuel state of 3.8. I continued to call out VSI numbers over the ICS. The pass seemed like it was on fast forward, as we touched down and engaged the arresting gear near its limits. Before we knew it, we were safe on deck, and I was folding the wings. The pilot and I looked at each other, and we simultaneously exclaimed, "Wow!"

We taxied back to the fantail and parked in a wing-spread spot to give maintenance a chance to trouble-shoot. We spread the wings and lowered the flaps and slats. Everything came down and the stab shifted to extended throws. No broken cable or other abnormalities. ASR worked as well, and the pilot wiped out the controls with normal responses. We shut down and handed the jet over to the maintainers for a closer look.

They found that the stab-shift cable properly was routed and had the appropriate tension. There also were no problems with chafing, fraying, or pulleys loose or out of place. Maintenance couldn't duplicate the gripe on deck and sought advice from the fleet-support team in the states. This situation has happened before, but in each of those cases, they found an identifiable problem with the stab shift cable, either with routing or tension. The tech reps back home seemed to think we had an indication problem, and the stab actually shifted. Maintenance removed and replaced the IPI, and the aircraft was back in service.

The slat problem and the cabin-pressure failure were separate issues altogether, only to serve as distracters to the more serious task of recovering safely aboard ship. Crew coordination was outstanding, with the backseaters backing us up with aviation, navigation and checklist management. We could have improved the way we handled our communication with the ship by getting the word out a little earlier, and also by realizing we were blue water, and our divert assumption probably was not going to happen. The ship did a great job of making the speed required for the winds we needed to recover safely.

We Monday-morning-quarterbacked this one to death in the ready room after we realized our stab probably had shifted, and there was no need for the circus landing. But, we trusted our instruments and followed the checklists in NATOPS. We proved that when all else fails, falling back on your NATOPS knowledge, training, and using some sound judgment usually will get you home. A brisk ocean breeze every now and then doesn't hurt either!

LCdr. Dobson flies with VAQ-136.

Better Instrument Approaches

By Lt. Brent Bergan, USCG

Could we prevent mishaps if we had better training? A review of recent Coast Guard Aviation Safety Reports indicate that four H-65 Class A and B mishaps could have been prevented through training. These four mishaps stated loss of situational awareness (SA) or spatial disorientation (SD), or both, as mishap causal factors. To reduce these causal factors, a pilot's instrument hood was developed as a training aid.

A Coast Guard pilot recalled that while doing a let-down, he almost put the helicopter in the water. To prevent that from happening again, he designed a translucent instrument hood that lets light in but does not allow you to see out. The instrument hood, more of a visor, does a good job imitating daytime instrument conditions. The hood also prevents the pilot from using peripheral vision; only an instrument scan is possible.

Spatial disorientation and SA are intimately intertwined and often are causal factors in mishaps resulting in controlled flight into terrain (CFIT). Spatial disorientation is characterized by an erroneous sense of one's position and motion relative to the plane of the earth's surface.

The instrument hood can be made from pattern plastic at your local fabric shop, with a strip of Velcro on the top to keep it on your helmet. The instrument hood slides in between the dark helmet visor and the visor holder (or the clear visor and visor holder on the new green helmets). The visor design meets the Coast Guard AIROPS 3710 requirements for simulated instrument conditions:

1. It doesn't obscure the safety pilot's vision.

2. It can be instantly removed or positioned by the pilot using the device so that he or she has full, unobstructed vision.

3. It isn't attached to the aircraft.

Realizing that vision accounts for 90 percent of our orientation and will override our other orientation systems, we must restrict our ability to see while executing practice instrument procedures. This situation is especially critical to the Coast Guard's instrument approaches to the water, where minor deviations in altitude and airspeed can become major problems.

The Coast Guard's instrument takeoff mins are one-quarter-nm visibility for operational missions, or less than one-quarter-nm visibility with the commanding officer's approval. We have the need (either survivor or vessel in distress) and a procedure to arrive in a 50-foot hover at datum, in a hover or slow air taxi on instruments. The procedure for the HH-65 Dolphin is called a MATCH (manual approach to a controlled hover) or CATCH (computer approach to a coupled hover). These procedures are designed to complete an instrument approach to datum from 300 feet (or up to 2,500 feet for a CATCH) at 70 knots, to arrive at datum at 50 feet and 30 knots for the MATCH, or zero ground speed for the CATCH.

I have been in several situations where high-quality copilots flawlessly have executed a daytime MATCH without the instrument hood. I then had them to try the instrument hood; the difference is startling. One copilot used the instrument hood during pinky time, and his airspeed dropped from 70 to 40 knots before his initial descent from 300 feet, and his altitude was off by more than 100 feet. Again, his previous MATCH without the instrument hood was to the standard level.

The instrument hood adds a sense of realism to this critical maneuver. It seems simple to choose the correct course into the datum. However, when you can't see the course inbound, it can be very challenging. Choosing the correct inbound course to datum can be more important than flying a good MATCH profile if the datum is close to land, in a fog bank, or in low-level clouds. A pilot must choose a course that avoids land and forces the pilot to use the tools of the HH-65 to maintain SA with regard to wind line, proximity to land, course inbound and outbound. A pilot then realizes the importance of using the radar.

The instrument hood increased my instrument skills tremendously and increased my proficiency executing a MATCH or CATCH. Not only will the instrument hood improve instrument-flying skills, but it also will increase overall SA while flying very challenging maneuvers.

Also, night-vision goggles (NVGs) are a relatively new device in the Coast Guard. Our need for actual MATCHs and CATCHs is limited when on NVGs. Obviously, it's much easier to do an NVG low-level approach to the water than use the MATCH or CATCH. Overall, our instrument skills, especially close to the water, are not quite as good as what we think.

Several arguments limit the use of the instrument hood or outright forbid its use. Concerns include using the hood in close proximity to other traffic, having junior personnel as the safety pilot during let-downs to the water, or using the hood at night. All of these concerns can be mitigated through proper use of the hood, by adhering to the guidelines within the 3710, and using the aircrew and the safety pilot to prevent any problems that may arise. Allow the flying pilot and safety pilot to fly these maneuvers in a benign environment, during day or night VMC, rather than for the first time during a challenging SAR case.

One last argument raised is that the hood induces flicker vertigo. This condition is a concern, as are all types of spatial disorientation. Only by experiencing spatial disorientation can pilots be made aware of its effects and the challenges that arise when it happens, because it will. A pilot using the instrument hood will develop a feel for spatial disorientation that can occur during MATCHs, CATCHs and instrument approaches, thereby increasing the pilot's awareness of the issue. Pilots' SA will increase by learning to focus on the tools of the HH-65 and not look outside to visually ascertain where they are and what they're doing during simulated-instrument work.

If you are interested in the instrument hood or would like an instrument-hood pattern faxed to you, contact Lt. Brent Bergan, Coast Guard Air Station Miami at: brent.r.bergan@uscg.mil.

The Coast Guard 3710 allows the use of this instrument hood, and the author's command endorses its use.—Editor.

There's PPE for Lawn Mowing, too.

On-duty or off-duty, wear the right protective gear. For more information on lawn mowing go to:
www.safetycenter.navy.mil/safetips/f-m/lawnmower.htm