



# The Safety Sigma

*Mission Readiness through Operational Safety*



Late Summer/Early Fall 2012

Volume III, Number 3

From the Director:

## Competition, Communication, Ethics and Excellence

*CAPT Bob "Cosmo" Conway, USN – Director*

As I say to the PCOs and PXOs in my Aviation Safety Command classes, "I am going to make your ears bleed with the word 'communication'." Why do I say that? Because everyone can stand to be better at communicating. What is the benefit of good and proper, free-flowing communication? Better awareness. What is the benefit of maximized awareness? The ability to make better risk decisions. And you've heard me say this before: I challenge you to name one decision in the professional arena that does not involve some sort of risk.

What are the barriers to maximized communication? There are many but of concern to me and should be to you, the front line commanders, has to do with a climate, external to your command, being implemented of which you have little control over. Not your problem then? Think again.

Let's talk about the perception of a zero defect mentality. Let's talk about Perform to Serve. Let's talk about competing department heads that report to the command too closely together driving a tough choice for the CO on whom to crown "My #1 of X". Same thing for JO's, senior enlisted and the like. The problem is the effects of negative competition. Don't get me wrong, I think competition is good when applied correctly. I've often stated that the lack of competition breeds mediocrity but there are negative aspects of a climate of competition to watch out for.

What it boils down to is admitting mistakes. Mistakes that may seem small enough to cover up now, in order to maintain the competitive edge, but may be the sign of something deeper and significant that you, Skipper, would like to know about so you can squelch the cause (not the individual!). Nipping bad things in the bud is always desired, but if a festering negative spirit of competition exists in your command (i.e. getting ahead at all costs), that bud will blossom and may bloom into a mishap. However, solving this issue is a two-way street and it is here where you, Skipper, can have an effect on minimizing the consequences of these unwanted but ever-present external climate drivers.

Ethical decision making is half the battle. Do you want your folks to have the moral fortitude to come forward and admit an honest mistake? I hope the answer here is yes. Are your people equipped to do so? If not, you may want to consider some targeted ethics training. The topics that Mr. Dave Beard provided in ASO and ASC classes are a good

start. However, just as important is the communication synergy created when a "Just Culture" is fostered by the command leadership (aka everybody). Recall that Dr. James Reason stated that a Just Culture is:

"An atmosphere of trust in which people are encouraged (even rewarded) for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior."

The ethical decision to come forward in admitting an honest mistake is propelled by the climate being set that encourages the admission of honest mistakes. It's a win-win but ever so difficult to achieve. This is where the art of leadership comes in and it starts with you, Skipper! It may not happen all at once but in today's real and perceived environments, it is imperative you monitor, evaluate and improve the climate so that your command's competition, communications, ethics and excellence are maximized. 

## Fair Winds and Following Seas

*As many of you are aware, CAPT Conway recently retired after 31 years of naval service. It's difficult to prove when a disaster was averted or a mishap didn't happen, but CAPT Conway's devotion to mission accomplishment and his thoughts and teachings shared with countless leaders over the years, have undoubtedly contributed to those events being "almost mishaps" rather than mishaps. He significantly impacted the School of Aviation Safety as well as Naval Aviation, and his legacy for charting the future of SAS and Naval Aviation Safety will be acknowledged for decades. The SAS Staff gratefully wishes an enjoyable and successful future to the "Boss." –Ed.*

### INSIDE

- Man:** Aircrew Causal Factors
- Machine:** Beware Wake Turbulence
- Medium:** May You (not) Live in Interesting Times
- Mishaps:** HFACS and the SIR
- Semper P:** Back to Basics
- CRM:** Inter-Culture CRM Barriers
- "Doc" Bank Award:** ASO student recipients
- SAS Hail and Farewell**

# A CENTURY OF MARINE AVIATION

30 January, 1960

An exercise is conducted at Vieques, Puerto Rico, to evaluate new techniques in the employment of helicopters during a vertical assault. The findings initiate modifications to amphibious assault ships.

- *100 Years of Marine Corps Aviation: An Illustrated History*, by Roxanne M. Kaufman

Although it is well-known that HF is the single most frequent causal factor in aviation mishaps, the frequency of specific types of HF acts has not been clearly stated in previous research, in terms of the DoDHFACS taxonomy, for Class A USN/USMC mishaps. HFACS provided a standard means by which HF causal factors can be analyzed, using well-established HF theoretical approaches, so that specific HF causal factors can be identified and controlled for in the future. 



MV-22Bs of VMM-365 provide an impressive display of potential combat delivery power. (Photo by Lance Corporal Martin Egnash, USMC)

## Man: Aircrew Causal Factors

LCDR Phil “Dr. Phil” Fatolitis, PhD, USN – Human Factors Instructor

We recently examined the frequency of causal acts (defined by the DoD Human Factors Analysis and Classification System [DoDHFACS]) committed by aircrew in U.S. Naval (USN/USMC) Class A mishaps from 1999 to 2010. DoDHFACS is a means to classify human factors that are causal to aviation mishaps in the DoD.

Class A mishaps reflect events in which lives and significant materiel are lost. Given that human factors (HF) historically constitutes the most common causal factor in aviation mishaps, classification of specific HF causal factors can provide a means to improve mitigation strategies.

Class A mishap causal acts were classified using DoDHFACS and archived at the Naval Safety Center. These data were accessed and analyzed to determine the frequency of causal acts in Class A mishaps. Results showed that skill-based errors were the most frequent DoDHFACS causal act across all platforms, followed in order by: decision errors, violations and perception errors. These results are summarized in Figure 1.

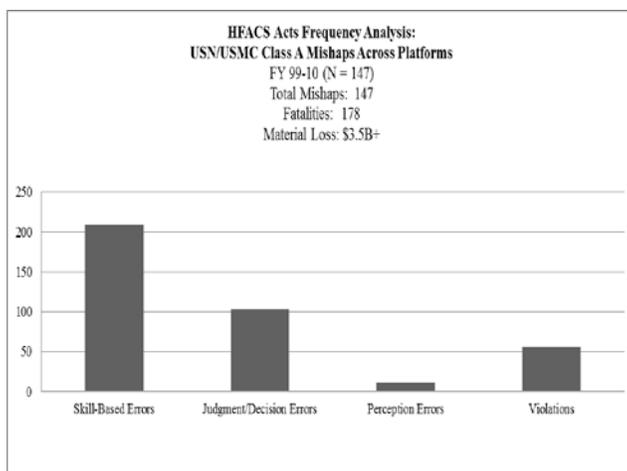


Figure 1. Summary of results across all U.S. Navy & Marine Corps platforms.

## Machine: Caution, Wake Turbulence

LT Karl “HK” Orthner, USN – Fixed Wing Aerodynamics Instructor

When these words are spoken, tower operators have relinquished the responsibility of proper separation to you, a finely tuned aviator. It seems basic enough: do not run into the other aircraft. Of course it has to be much more complicated than that. Wake turbulence is generated by the lead aircraft and could produce uncommanded aircraft movements that can overcome the abilities of not only the pilot, but the aircraft as well.

All aircraft produce wake turbulence. Lift is generated by the wing due to the static pressure differences between the top and bottom surfaces. Because the bottom surface generates more static pressure than the top surface, the ‘air’ looks for the easiest place to get to the lower pressure. This leads to a rollup of airflow at the tip of the wing. The swirling air mass now travels downstream and becomes the wake turbulence we all know and love, depicted in Figure 2.

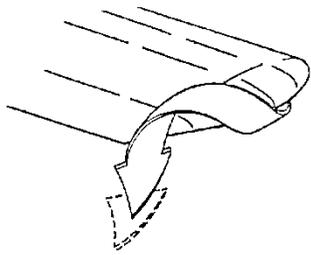
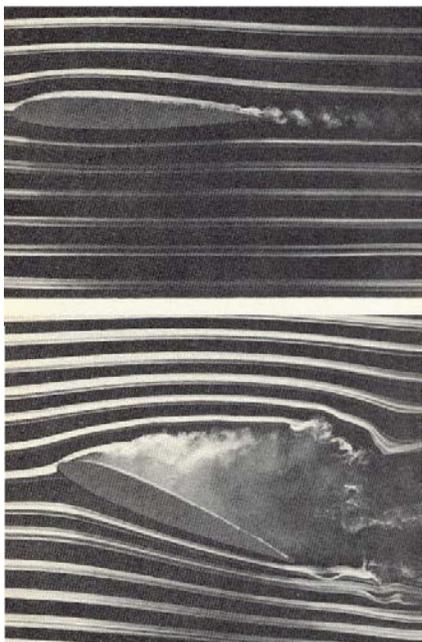


Figure 2. Wingtip vortex generation.

The FAA categorizes aircraft by weight in order to provide sufficient separation between aircraft. However, this is for IFR only. The pilot is responsible in VFR or when the pilot cancels IFR in order to proceed VFR. Categorizing aircraft by weight makes sense. The pressure difference between the top and bottom surface must be increased in order to generate more lift on the aircraft. Even though weight is a major factor, strong vortices are produced by aircraft flying slow and in clean configurations. By flying slowly, the velocity over the wing is decreased which in turn eliminates the lift over the wing (think lift equation). By increasing the angle of attack, the aircraft is able to overcome the decrease in velocity. Of course, a ‘no free lunch’ situation is developed in which more turbulent air is generated behind the wing.

FLYING SLOW=INCREASED WAKE TURBULENCE.



The deployment of flaps and slats do change the airflow over the wing. However, an aircraft in a clean configuration has more concentrated vortices located at the wingtips.

CLEAN CONFIGURATION=INCREASED WAKE TURBULENCE

Congested airspace and airfields are now the norm. Fixed-wing, helicopter, even tiltrotor aircraft operate out of

the same facilities and all have their own unique wake turbulence. Flying below the glidepath of C-130 might not be the smartest thing to do even though you are a P-8. I do not think that a 70 kt closure on a MV-22 is an intelligent idea either, especially if you are a T-6B. By discussing wake turbulence, sharing stories, and mitigating the risk, you can have a plan in place when tower tells you, “Cleared to land, number 2 behind a 757, caution wake turbulence.” 



A C-2A is taxied aboard the USS Dwight D. Eisenhower in preparation for launch. (Photo by Petty Officer 3<sup>rd</sup> Class Robert Rupp, US Navy)

## A CENTURY OF MARINE AVIATION

13 February, 1943

The F4U Corsair makes its combat debut when pilots from VMF-124 meet air opposition while escorting PB4Ys of VP-51 on a daylight strike against enemy shipping in the Kahili area of Bougainville.

- *100 Years of Marine Corps Aviation: An Illustrated History*, by Roxanne M. Kaufman

## Medium: May You (not) Live In Interesting Times

CDR Dave “Ivan” Ivezic, USN – Associate Director / Programs Instructor

I spent a year as the Aviation Safety and Ground Safety Advisor to the Afghan Air Corps. As you can imagine, that job had “interesting” written all over it. Let me give you a sea story about one of the “interesting” conversations I had. A few times a week I wandered up to the Afghan Wing Commander’s office to chat with him. A combat experienced fighter pilot, trained in the Soviet Union, shot down a few times while flying a MiG, imprisoned by the Taliban for two years awaiting the finishing touches of a death sentence, and

now a Brigadier General trying to keep his country moving forward. Needless to say his stories were fascinating and they provided me with a crucial perspective on how to package Aviation Safety for these old, hardened leaders.

One day when providing the General an overview of the safety system his Safety Officers developed, he politely smiled, listened to us, and concluded that Safety is very important, but Afghanistan is very dangerous and flying in Afghanistan is even more dangerous. He went on to say that if they tried to do things safely then they would never fly. To him, Safety meant not crashing, getting shot down, or killing any of his people. His paradigm of Safety was to eliminate all risk, but we know better...right?

I'm afraid not all of us do. I'm writing this because I occasionally hear the same general comments coming from our Naval Aviators – "Safety has its place, but when you need to get the mission done sometimes you just gotta put safety away" or "Safety is too touchy-feely" or "Aviation is inherently unsafe" or "Safety tries to deflect the blame from the pilot to the command."

What is "Safety?" Safety is simply a word to capture the process of figuring out what's going to kill you or trash your equipment, finding realistic ways to prevent that from happening, and then and successfully executing the mission. The tenets of Safety don't stop people from doing their mission when it gets too dangerous – they allow for mission success when the risks start increasing.

Touchy-feely? Bunk! My guess is that some people equate trust and wearing the proverbial "white hat" to being soft and sensitive. Complete bunk!

Blame? Pure and total horse bunk! Naval Aviation is a complete system starting at the OPNAV level and encompassing everything down to the individual aircraft and aviator. As Aviation Safety Officers we try to identify as many hazards as possible at every echelon in the Naval Aviation System. We don't care about blame. That's for the XO and JAG to dole out.

Our job is *causal factors*. My definition of a *causal factor*: an unidentified and/or unmitigated hazard that contributed to a mishap. The biggest causal factor in any Naval Aviation mishap is the blob of organic material wearing a flight suit and Ray Bans. The reality is that since Naval Aviation is a complex system, there is little chance that the human causal factor stands alone. I'll concede that it occasionally does, but almost all mishaps can be traced through several levels of preexisting hazards within the whole system. Assigning blame has very little value, but identifying causal factors saves lives and preserves our resources.

Enough soap box. I'll get to the point. We are fortunate that we don't have to buck against cultural chasms and decades of Soviet rule when we try to instill a culture of safety within our commands. We do, however, have to continue to work on the misconceptions that exist regarding the tenets and purpose of Aviation Safety. I'll leverage off a quote from General Colin Powell, "The day the soldiers stop bringing you their problems is the day you stopped leading them." Under the same leadership principle, if the people of your command duck into doorways and avoid eye contact when they see the Safety Officer then you have some educating to do. When people bring their problems to you, it's an indication that your program and message are effective.

Do you have any nay-sayers in your unit? How do you handle them? Let me know so we can pass the lessons to those who follow. [david.ivezic@navy.mil](mailto:david.ivezic@navy.mil) 

## OPNAVINST 3750.6 Refresher:

*A hazard is a potential cause of damage or injury under human control. Submit Hazard Reports whenever less than mishap reportable damage or injury occurred, a hazard is detected or observed or whenever an event occurs that should have been a mishap but was averted due to luck or quick reaction.*

- Ch 4, par 404.a.

## Mishaps: HFACS and the SIR

LCDR Jeremy "Ricky Bobby" Niles, USN – Reporting Instructor

Hazard Reports (HAZREPs) are essential in raising awareness of the hazards that threaten the fleet. HAZREPs are also used to ensure that those who control money have the information available to properly prioritize funding for design upgrades and new safety features. 3750.6R declares that "everyone associated with naval aviation has an obligation to report hazards." It further states that "it is essential that commanding officers encourage and command safety programs foster hazard reporting." This demonstrates the responsibility of all commands to ensure that they are reporting the hazards they are seeing in order to further the culture of safety in the fleet.

What is a hazard considered worthy of reporting? 3750.6R defines a hazard as "a potential cause of damage or injury that is under human control." Therefore, anything that creates a hazard related to naval aviation should be reported. I've been asked if a hazard that was seen in the simulator could be written. My response was, YES, if it is an event that could be duplicated in the aircraft. If someone can learn from a mistake and help "identify and eliminate hazards before they result in mishaps," then report it.

How much do you put into a HAZREP? Time permitting; you should put the same amount of energy you would put into a mishap investigation. The process is the same. Get all the information you can, determine possible causal factors and dig deeper, support your causal factors with facts (LOEs in SIR), and provide recommendations to eliminate or mitigate the causal factors associated with the identified hazards. Many times a HAZREP is just one step away from being a mishap, so it is essential that we all learn from hazards and help shore the holes in the "swiss cheese."



# Semper Paratus: Back to Basics: Further Back than We've Gone in the Past

LT Jim "Pugsly" Bates, USCG – Coast Guard Instructor

To prepare me for my new job as the Coast Guard instructor at the Navy's School of Aviation Safety (SAS), I was sent to Embry-Riddle Aeronautical University in Prescott, AZ to expand my knowledge and conduct research relating to aviation safety. Inspiration for my research was not hard to find. As an ASO student in the summer of 2008, fellow students and SAS staff asked what the Coast Guard was doing *right* to earn such excellent mishap rates. This was months before our infamous string of eight Class A mishaps began in the fall of 2008, which has cost 18 lives so far. Now our service has spent the last few years trying to figure what's *wrong*. My research needed to align with this cause. One suggestion from leadership was a "back to basics" approach, focused on increasing our proficiency in the basics of our profession: flight manuals, FAR/AIM, the 3710, etc. Surely this is necessary, but we do not need to stop there. Perhaps we must also reference something more basic, our core values of "honor, respect, devotion to duty." Our "honor, courage, commitment" compatriots in the Navy and Marine Corps might learn something here as well.

A graduate school elective class in "Safety Ethics" opened my eyes to a relationship I had not thought much about before. Ethics, be they personal, cultural, or professional, guide our judgment in the operational environment as much as they guide our interpersonal relationships. In turn, our judgment in the operational environment certainly has a whole lot to do with safety. When most military professionals think of ethics, they immediately think of core values. The next connection, between core values and safety, is perhaps harder to make for most of us. A few thoughts came to mind:

- I believed most Coast Guard members felt core values, especially "respect," were almost solely tailored for the office environment, not the operational one. After all, our training videos and lectures on the subject mostly seem to focus on race, religion, and gender. Respect is much broader than this.
- Proper Operational Risk Management (ORM) requires judgment backed by sound ethics, but I was not sure it was routinely looked at in such a way by our service.
- Non-compliance with a procedure, SOP, etc., is the result of an ethical choice suggesting that the aircrew's particular course of action is better or more important than those provided by their leadership or doctrine. If we thought of non-compliance in this way, perhaps we could avoid some of the bad situations we get ourselves into.

I developed a few hypotheses and committed to the research. Coast Guard pilots serving at air stations in the fall of 2011

were surveyed and 195 responses were received (a 20% cross-section), revealing the following:

- 15% of respondents said core values do not guide their preparation for duty/flight.
- All requirements of ORM are not met in 14% of flights.
- Top reasons respondents gave for being non-compliant with ORM:
  - Not enough time (23%).
  - No clear expectations of ORM at their unit (11%).
  - Don't believe in a formal ORM process (2%).
- 35% of respondents say their unit has no requirement for ORM in-flight.
- 55% of respondents do not agree that core values are applicable to operational decision making.

Whether these results are an outrage to you or hardly significant, they still suggest vast room for improvement. General non-compliance, deficient ORM programs (local or service-wide), and a disconnect between core values and the operational environment are all things that must be addressed. Former Chief of Staff of the Coast Guard Admiral Currier's breakdown of the Aviation Safety Assessment Action Plan (ASAAP) in his "Open Letter to Coast Guard Aviators and Aircrewmembers" in late 2011 revealed corroborating findings: degradation of ORM/CRM, breakdown in professional discipline, and poor risk management, among others.

Perhaps a different view of our core values can unearth some changes we can make personally or corporately. Consider below the basic definitions of our core values, paraphrased out of Coast Guard Publication 1, and the respective questions to ponder:



Petty Officer 2nd Class Joshua McCarthy, left, carries gear from a downed small plane to a Coast Guard MH-60 Jayhawk helicopter while Petty Officer 1st Class Scott Gordon, center, talks to one of the two passengers of the aircraft while Lt. Jesse Wright, right, waits for them in the helicopter on the beach 62 miles from Cordova, Alaska on May 8, 2011. The Coast Guard crew, forward deployed to Cordova from Kodiak, rescued the two men and returned them to Cordova. (Photo by LT Jon Bartel, USCG)

Honor is closely associated with integrity, loyalty, and accountability.

- If we are reluctant to self-report incidents in the aircraft, does it reflect poorly on our accountability?
- Does the way we operate our aircraft miles from home look similar to how we operate it with the CO onboard?

Respect is the honoring of human value without discrimination and involves justice with fairness and compassion.

- If we show up for flight/duty unrested and unprepared, is that not disrespectful to our crew and pax?
- Are excessive delays in mishap reporting disrespectful to our people and the safety program?

Devotion to duty is best described in the form of an oath taken directly from doctrine: “We are professionals, military and civilian, who seek responsibility, and accept accountability, and are committed to the successful achievement of our organizational goals. We exist to serve. We serve with pride.”

- Are we always focused on our primary missions or do we sometimes allow too many things to reside under the umbrella of “doing the king’s business?”
- Are we careful with periods of our flights that are neither “training” nor “operational?”

Could a core values view of aviation safety help you, your unit, or your service improve overall safety? Kick these questions around your next pilot or aircrew meeting and see what happens. 🦅



An EA-18G conducts aerial refueling from a Marine Corps KC-130. (Photo by Staff Sergeant Amanda Dick, USAF)

## Crew Resource Management: Inter-Culture CRM Barriers

Capt Scott “Francis” Key, USMC – CRM programs

In many parts of the world, cultural acceptance can be a very large barrier to CRM, particularly to assertiveness and communication. Many of us have flown into countries where ATC will not communicate with a female. We are usually able to foresee this barrier and overcome it by having a male copilot or pilot. However, sometimes we cannot foresee cultural issues and, if left unchecked by proper CRM, they can

Late Summer/Early Fall 2012

lead to disaster. Below is a paraphrase of an article titled “Ineffective Crew Management Blamed For Air Crash” from The Hindu newspaper in India, February 20 2012:

*On May 22, 2010 the Air India Express Boeing 737-800 overshot the table-top runway at Mangalore International Airport. The crew was a combination of a Serbian PIC and an Indian first officer. The 175 page report by the court of Air Marshal B.N. Gokhale stated that among other things, the cockpit lacked CRM due to mixed cultural issues.*

The PIC was sleeping for an hour and 40 minutes before arriving in the terminal area which may have led to sleep inertia. There was no conversation between the two for a long time during the flight. Possibly due to the cultural tension in the cockpit, the First Officer did not wake the Captain until near the terminal environment. The aircraft overshot the table-top runway and plunged off the cliff into a wooded valley. The Serbian PIC had ignored the first officer’s two calls to go around on finding that the parameters were incorrect.

This article highlights the fact that while CRM has come a long way in changing the culture of aviation, the fight to overcome barriers continues. It is not just inter-cultural barriers that can create an alienated cockpit. We have all seen crews become alienated from each other based on personality, rank, or culture. Sometimes the wall between the seats in the cockpit, aircraft in a section, or the fore and aft of the aircraft is almost visible. Some attitudes that build this wall are “it is his aircraft, I don’t care if he gets a flight violation” or when an overly aggressive PIC shuts down the other crew members. Both of these result in a multi-crew aircraft flown solo or a section of aircraft flown as a single. The PIC or section lead is responsible for ensuring that a crew does not become alienated. However, it is the responsibility of the entire crew to speak up if they see this wall developing between the crew. This wall can only be removed by recognizing and addressing its presence with good CRM. 🦅

## Doc Bank Memorial Distinction: ASO student recipients

The Milt “Doc” Bank Memorial Distinction, recognizes the student or students in each graduating ASO class that best exemplify the characteristics of the late, great Milt “Doc” Bank, PhD: motivation, intelligence, imagination and aptitude as a potential future ASO Instructor. The recipient of this award in ASO Class 12-4 was Lieutenant Commander Charlotte Pittman, USCG, of Headquarters, United States Coast Guard. The recipient in ASO Class 12-5 was Lieutenant Commander Brian Morgan, USN, of Naval Air Station Oceana, VA. For ASO 12-6, two recipients were awarded this honor: Captain Joseph Kennedy, USMC, of Marine Light Attack Squadron 369 and Captain Mike Van Wyk of the US Navy Flight Demonstration Squadron. Congratulations to all! 🦅

## SAS Hails and Bails:

This summer we bid farewell to Lieutenant Commander Ally “Showgirl” Shuler as she has returned to flying at Helicopter Training Squadron Eighteen. We also wish “fair winds and following seas” to Lieutenant Bruce “Cabbage” Lindsay, of our Crew Resource Management division. Cabbage will soon report to Joint Expeditionary Base Little Creek. Joining our staff to provide USCG training and all-around experience to the safety professionals here at SAS, we welcome Lieutenant Jim “Pugsly” Bates, USCG. 

The Safety Sigma is published quarterly by the Naval School of Aviation Safety located at NAS Pensacola, Florida. If you have a question for the staff, or are interested in attending Aviation Safety Officer, Aviation Safety Command, or Crew Resource Management Instructor training, please visit our website at <https://www.netc.navy.mil/nascweb/sas/index.htm> or call (850) 452-3181. **If you would like to submit** a short article for publication, please contact LtCol Stephen “Bender” Dickerson at (850) 452-5145 or [stephen.m.dickerson1@navy.mil](mailto:stephen.m.dickerson1@navy.mil).