



The Safety Sigma

Mission Readiness through Operational



Fall 2011

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From the Director:

Cultural Change

CAPT Bob "Cosmo" Conway, USN – Director

Is cultural change needed in your command? That's a broad and ambiguous question so let's narrow that down a bit. Skipper, if you could change or improve anything in your command, what would it be? Even if you only have one item on your list, then you could use a cultural change.

The terms command culture and climate are often confused but to help define and delineate between the two entities, try using these two aids: 1) Command climate drives the command culture and 2) when you hear the word "culture," mentally replace it with the phrase "behavioral norm." In other words, command climate drives the behavioral norms within the squadron. So what is on that list, Skipper, and most importantly, how can you achieve your desired change or improvement?

There are volumes written on this subject and to try to condense things down to a Sigma article would be a gross injustice, but I can tell you that command climate is the key to starting and sustaining the process. To kick start things, try taking a look at the local climate or "micro-climate" in which that issue or item needing change exists. What is it that shapes it? Attitudes of key people? Resources? Treatment of subordinates? Status Quo?

Just as we can drill down in a "root cause analysis" to find foundational elements that affect certain problems in the command, we can use this same process in looking for the causes of undesired outcomes that require desired change or improvement. Once you have a handle on what is causing the shortfall in performance, you can begin the change/improvement process.

Again, there are volumes written on the subject but to start I would recommend taking a look at John Kotter's 8-stage change process as described in his book "Leading Change" (you can also Google it). John Kotter, from Harvard Business School, is a recognized expert on leadership and change. His 8-stage process can be adapted for major or minor change and has been used successfully in both military and civilian applications. Regardless of whether you use this model, find a proven method and use it. Should you decide to go it alone, studies have shown that you have a better than average chance of achieving mediocre results slightly skewed to the side of failure.

The best chance at succeeding in your change process is to talk to folks that have been successful in positively changing things as well as studying those who have done the same and studied these matters in great detail themselves. Be sure to grab your ASO by the scruff of the neck, too, to help you out. These folks spend 4 ½ weeks in sunny Pensacola learning to be subject matter experts and agents for cultural change.

Success in change or improvement revolves about the climate or the tone the commanding officers set. And for the vast majority of CO's out there, constant improvement is always on the menu. Your success will be determined by you and your squadron's understanding of the problem, the fix, and the process as driven by the climate you set. So Skipper, what's on your list? 

INSIDE

- Man:** Dr. Phil is in the House
 - Machine:** Takeoff and Landing Distances
 - Medium:** Decision Making – Chicken or the Egg?
 - Mishaps:** Know Your Available Resources
 - Semper P:** Know Your Concept of Privilege
 - CRM:** Face Threats
-
- "Doc" Bank Award:** ASO student recipients
 - In Memoriam:** Ms. Deb Dameron



An F/A-18C of VFA-192 launches from USS John C. Stennis, CVN-74 (Photo by Petty Officer 3rd Class Haskell Jackson, US Navy)

Fall 2011

The Safety Sigma

Page 1

Man: Dr. Phil is in the House

LCDR Phil "Dr. Phil" Fatolitis, MC, USN – Aeromedical

Greetings from LCDR Pete "B.B." Walker's relief, and your newest School of Aviation Safety (SAS) Human Factors instructor. It's a privilege to work at a place with such a dedicated and knowledgeable group of people who serve such an important purpose. Mr. Bill "Pop" Little has been great in helping me to get settled in and adapted to the SAS way of life.

Having been here a few months, it's been repeatedly impressed upon me that I have some big shoes to fill coming in behind B.B. As daunting a task that this may be, I have every intention of doing so (with some guidance from Pop, of course)! First, Naval Safety Center has provided access to a decade-spanning database containing U.S. Navy and Marine Corps mishaps that have been coded using the DoD Human Factors Analysis and Classification System (HFACS). Among other things, analysis of this database will enable us to determine the frequency of human factors causal factors across all platforms. For example, preliminary findings show that skill-based errors and decision-based errors constitute the overwhelming majority (82%) of causal HFACS acts in Class A mishaps, on average, across all platforms. While this may be no real surprise to those of you who are intimately familiar with the operational aviation environment, results such as these can be useful in informing those of us who do not "live in the cockpit" but who can assist in designing mishap mitigation approaches. When the analysis is complete B.B., LT Tony "Hollywood" Anglero (Naval Safety Center) and I hope to publish the results in a reputable journal.

Second, I'm very excited to announce a SAS first: we'll be standing up a "no-kidding" human factors research laboratory over the next few months. SAS has been able to acquire equipment (high fidelity flight simulator, eye tracker and other physiological sensors) that will provide us the capability to conduct human factors research that is on par with or exceeds that of some of the best government and university labs in the nation. SAS has already partnered with the Naval Postgraduate School to cover some administrative essentials for laboratory operations. We've reached out to local flight surgeons to provide an opportunity for collaboration. We also hope to collaborate with local organizations such as the Institute for Human and Machine Cognition and the University of West Florida, and any other organization that shares our goal of mishap prevention. The lab should be operational within six months, given timely delivery of equipment and the absence of logistics/facilities problems, at which time we'll set about conducting world class aviation safety research...right here at SAS. 

Machine: Takeoff and Landing Distances

LT Karl "HK" Orthner – Fixed Wing Aerodynamics Instructor

Naval aircraft are built and designed to fly anywhere around the world. However, it is important to realize how an aircraft's performance may change in different environments. Having a basic understanding of the influences of weight and altitude on takeoff and landing performance can help prevent the next mishap.

	Takeoff Dist.	Landing Dist.
Increase of Weight ($W_2 > W_1$)	Increase by $\left(\frac{W_2}{W_1}\right)^2$	Increase by $\left(\frac{W_2}{W_1}\right)$
Increase of Altitude (Density Decreases) ($\rho_1 > \rho_2$)	Increase by $\left(\frac{\rho_1}{\rho_2}\right)^2$	Increase by $\left(\frac{\rho_1}{\rho_2}\right)$

During takeoff, an increase in weight increases the takeoff distance by the square of the weight ratio. For example, if one doubles the weight of the aircraft, the takeoff distance increases by a factor of 4!!! This is due to two factors: (1) increase of velocity needed to generate the lift necessary to takeoff and (2) slower acceleration due to a higher weight.

During landing, the increase in weight is not as drastic but is still significant. The approach velocity needed to generate the lift necessary for landing is increased based on weight. The deceleration difference however would not change based on weight due to similar braking action.

An increase in altitude will also increase takeoff and landing performance, but not as drastically as weight. For example, a typical takeoff roll of 4,000 ft at sea level would be 5,400 ft at 5,000 ft above sea level.

That is a 35% increase!! This is once again due to an increase of velocity, but also due to the less available thrust from the engines at the higher altitude. During landing, the increase in altitude is not as drastic because it only deals with the approach velocity needed to generate the lift. Once again, the deceleration difference would not change based on weight due to similar braking action at different altitudes.

Naval Aviation completes missions all around the world. Recognizing how the aircraft will perform at different locations (especially takeoff and landing) is important in preserving lives and assets. 

Celebrating a Century of Naval Aviation

The most decorated aircraft carrier of World War II, USS Enterprise (CV-6), was launched on 3 October, 1936. She was commissioned on 12 May, 1938 and joined the Pacific Fleet in April, 1939. The Enterprise received 20 Battle Stars and is the only ship outside the Royal Navy to receive the British Admiralty Pennant in the more than 400 years since the creation of the award. (cv6.org)

Medium: Decision Making – Chicken or the Egg?

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

Occasionally in our ASO classes I hear a conversation that goes something like this; “Are Decision Making (DM) and Situational Awareness (SA) a part of CRM or does CRM enable good SA and DM?” For fear of getting in our CRM brethren’s Kool Aid, I will tread lightly, but throw a different perspective into the debate.

During any flight, the aircraft constantly reacts to pilot inputs. Ultimately, that is what determines the success of a flight or mission – an entire series of correct inputs, or an incorrect input followed by correct remedial inputs (the basis of Threat and Error Management). The obvious exception is a catastrophic aircraft failure that renders the plane uncontrollable.

Now you are saying, “you’re a master of the obvious, Ivan!” Follow me here. I have a point.

What drives the pilot to make inputs? Decisions. Decisions determine the pilot’s actions (or inaction) and those decisions are based on the information available. We can argue that consistently good decisions will result in consistently successful missions.

Peel that concept back a little further. What factors does the pilot have to drive his or her decisions? Here’s a list: knowledge (education), skills, experience, command culture, rules and regulations (standards), teamwork (CRM), self-discipline, physiological factors (health, fitness, fatigue), and psychological health. All these factors contribute to building an accurate and informed picture for the pilot.

“Accurate and informed picture” sounds suspiciously like Situational Awareness. This list of factors develops SA. I chewed on this model over the past few months when I realized it was missing the link between SA and DM. The answer came to me during a recent ORM discussion in class. We teach that ORM is a behavior-based decision making tool. In flight we as aviators use the Time Critical level of ORM. So, once the pilot has SA established, he or she can use TCRM (ABCD, OODA loop, or any other tool of their choosing) to make a decision.

Putting it all together. The factors I listed above develop SA. TCRM is a tool pilots use to translate SA into decisions, and those decisions ultimately drive every aspect of the flight and mission. To answer the original question, I believe that CRM (leadership, team member (assertiveness), communication, adaptability/flexibility, mission analysis) is a factor that feeds into SA and decision making (Figure 1). 🦅

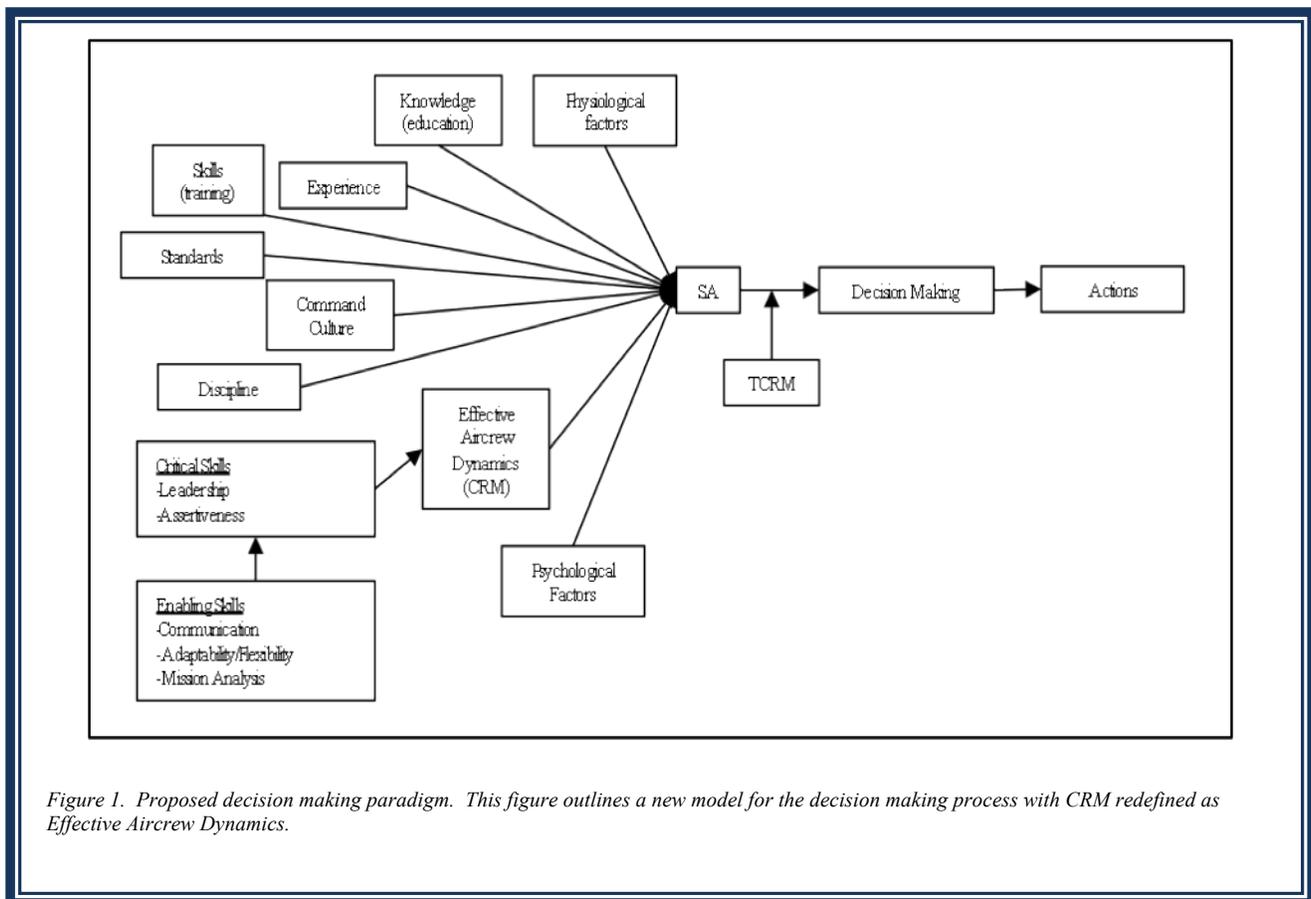


Figure 1. Proposed decision making paradigm. This figure outlines a new model for the decision making process with CRM redefined as Effective Aircrew Dynamics.

Mishaps: Know Your Available Resources

CDR Dirk "Dutch" Hart, USN – Reporting Instructor

The National Championship Air Races draw thousands of people to Reno, NV every September to watch various military and civilian planes race. During the races planes fly wingtip-to-wingtip and as low as 50 feet off the ground, following an oval path around pylons with speeds of up to 500 mph. Unfortunately, during this year's event on Friday 16 September a tragic aviation mishap occurred. Our thoughts and prayers go out for those involved.

Every ASO knows the key to any investigation and subsequent safety investigation report is to determine the causal factors of the mishap and other damage and/or injury, and to make recommendations to the appropriate agencies to prevent recurrence.

What can the Fleet learn from such a civilian tragedy? As a well trained safety leader, do you know what happens if a military and civilian aircraft are involved in a mishap? Do you know how to work with the Federal Aviation Administration (FAA) or National Transportation Safety Board (NTSB)? Are there sources out there to help? What do I need to know right now? If you do not know the answers to any of these questions, go to the Naval safety Center web-site for insight: <http://safetycenter.navy.mil/>. Select the "Aviation" Tab, then "Investigations" Tab, then look for the "Working with NTSB and FAA" link under "Senior Member Guide." Additionally, look up your respective FAA Navy representatives via the [FAA NAVREPs](#) link under "Points of Contact." This information will create awareness on how, why, and when to call on our civilian counterparts and military liaisons post-mishap. 



An Air Station Sitka MH-60 Jayhawk conducts hoist training with a Station Ketchikan 47-foot Motor Life Boat. (Photo by Petty Officer 1st Class David Mosley)

Semper Paratus: Know Your Concept of Privilege

LCDR Ally "Showgirl" Shuler, USCG – Coast Guard Instructor

COMDTINST M5100.47 states, "The concept of privilege is intended to prevent unnecessary disclosure of privileged safety information outside of the safety program." The concept of privilege was created to ensure that all causal factors in an aviation mishap are discovered. Additionally it is used to assure witnesses and survivors of a mishap that their testimony will be used for mishap prevention only.

Many students coming through ASO school, myself included, have admitted that they had little to no understanding of this concept prior to attending SAS. How well do the other pilots at your Air Station understand privilege? Has your hangar deck ever been briefed on privilege? Does your chain of command know how to handle privileged information after a mishap, and do they fully understand that a safety investigation and an admin investigation must not share privileged information? These are all questions that, as an FSO, you fully understand. It is incumbent upon the Safety Officer to continually check the sight gauge for the level of understanding of this concept within his or her unit.

One of the easiest ways to ensure an understanding of privilege is to explain it to every pilot and aircrew during their check-in briefs. Gauge the individual's understanding of the concept and provide on-the-spot training. Better yet, to more efficiently manage your time, provide each check-in with a concept of privilege handout that you briefly explain. With safety stand down season just around the corner, concept of privilege is also a simple and worthwhile all-hands training topic.

No matter how you do it, privilege cannot be reinforced enough at your Air Station. It is the cornerstone of the

OPNAVINST 3750.6 Refresher:

Loss of the following body parts does NOT constitute Permanent Partial Disability:

- Teeth
 - The four smaller toes
 - Distal phalanx of any finger
 - Distal two phalanges of the little finger
 - Repairable hernia
 - Hair, skin, nails, or any subcutaneous tissue
- Ch 3, Par 311.c

aviation safety program and by preserving and honoring the concept of privilege we are setting ourselves up for success in understanding how mishaps happen and how to prevent them in the future.

Fly safe and Semper Paratus. 



Harriers of VMA-214 land aboard an LHD. (Photo by Petty Officer 3rd Class Matthew R. Cole)

Crew Resource Management: **Face Threats**

LCDR Shawn "ShawnBo" Bowen – CRM programs

Have you ever been screamed at, belittled, or purposely embarrassed in the cockpit? If so how did you feel? Perhaps you screamed back and escalated the situation. Maybe, like a majority of people, you clammed up. The latter is particularly common if the yelling was done by someone you respected (i.e. instructor, senior aviator, etc.). How did the environment change in the aircraft for the rest of the flight? How did it change the next time you flew with that individual? Were you able to successfully complete the mission?

In 1998, Judith Orasanu, a Human Factors Researcher with NASA, et al., conducted simulation studies titled, "How Do Flight Crews Detect and Prevent Errors?" The study revealed that junior pilots are less likely to report a safety error or deviation if they view the senior pilot as threatening, which can be referred to as a "face threat." This is especially relevant in the training environment. Students at training squadrons find it very difficult to use effective CRM when the instructor has just crushed them in one way or another. The student does not want to create another situation where he or she might be reprimanded for saying or doing something incorrectly. The student fails to report errors or deviations, further facilitating a breakdown of communication and perpetuating the cycle of poor CRM. Therefore it is very important for the instructor, aircraft commander, or senior pilot to take the role of a facilitator and always use tact and mentorship in the cockpit in order to avoid these face threats.

Fall 2011

The Safety Sigma

This can happen in the fleet as well. Verbal arguments or perceived face threats can lead aviators to mentally check out of the flight to avoid any further conflicts, eventually leading to mission failure and possibly a mishap. Junior aviators need to feel empowered to challenge their superiors when they feel it is right to do so. Senior aviators should encourage discussion and expect to be challenged when the situation warrants it. Most of us brief "no rank in the cockpit." This is an excellent concept, but is it always practiced the way it should be? Disagreements will inevitably happen and it is up to each of us to remain professional, use tact, and to learn from every flight in order to ensure a safe and successful mission. 



An MH-60S of HSC-25 lands aboard the USS Essex, LHD-2 (Photo by Petty Officer 3rd Class Eva-Marie Ramsaran)

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 Doc Bank: motivation, intelligence, imagination and aptitude as a potential future ASO Instructor. The recipient of this award in ASO Class 11-6 was Lieutenant Kelly Deutermann, USCG, of Coast Guard Air Station Humboldt Bay, CA. The recipients in ASO Class 11-7 were Lieutenant William Chard, USN, of Training Squadron 10 at NAS Pensacola; and Captain Aleksandr Martin-Nims, USMC, of Marine Unmanned Aerial Vehicle Squadron Two at Marine Corps Air Station Cherry Point. 

Page 5

In Memoriam: Ms. Deb Dameron



It is with a heavy heart that we inform you that our Educational Specialist and “Gal Friday,” Ms. Deb Dameron, passed away a few months ago after a courageous battle with cancer. She never stopped smiling and continued to serve the school she loved literally until her last days.

Deb was the only civilian to come to Pensacola from Monterey in 2005. That transition could have not been accomplished successfully, nor could the school have performed as well as it did in Pensacola, without her passion and dedication. She proudly proclaimed that it was her “motherly instinct” that motivated her to excellence. She truly loved SAS and all of you, her students and colleagues.

She is survived by her daughter and son, a chaplain in the US Army. She has one grandson and a brother who is a pastor in North Carolina. She is dearly missed by all of us here. We hope you remember her as someone who went out of her way to support her students and staff, always wearing a radiant smile. 

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.