Spring Edition 2017

Combat Edge

ACC's Full-Spectrum Safety Magazine

F-22

Demonstration Team

PAGE 4

DISTRACTION.GOV **In 2014, 3,179 people were killed, and 431,000 were injured in motor vehicle crashes involving distracted drivers.**

Combat Edge

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THE COMBAT EDGE WILL RETURN THIS SUMMER

ACCent

Go Pro

Col. Robert B. Trsek
Director of Safety

17 feet. We stared at the numbers on the screen at our Red Flag debrief and everyone silently did the math again. Yep. A 17-foot pass between an F-15C and a B-52 in the push west, and nobody knew it until debrief. There was no collision, no mishap, and no investigation. "Debriefed."

Air Force Safety has long focused on reactive safety, that is, taking measures to improve safety *after* a mishap has occurred. While it's logical to react to a mishap, isolate causation and take measures to prevent recurrence, by virtue of being reactive, mission and monetary costs are already incurred, and lives may already be lost. When we can "see it coming," however, or when reactive safety has reached diminishing returns in providing useful trends, it's time to Go Pro.

Proactive safety seeks to get out in front of the mishap to prevent it from happening in the first place. It capitalizes on an informed safety culture that encourages reporting from all Airmen, embraces change in practices based on hazards, and does so without reprisal. By identifying hazards before the mishap, we get all the preventive measures without incurring the costs to mission or life.

Crew Resource Management – adapted to **Cockpit Resource Management** in the single-seat community—CRM has been a staple in aircrew training for decades, aiming to reduce mishaps attributable to poor decision making, cognitive biases, known human factors, low SA, or inefficient use of available resources. CRM is one form of Proactive Safety, but there's three more you might not be so familiar with.

Military Flight Operations Quality Assurance (MFOQA) is the analysis and trending of aircraft system and *flight performance data* to improve safety, operations, training, and maintenance functions. Aviation operational data is collected from onboard aircraft sensors and/or recorders, compiled, and analyzed to detect trends and develop mitigation through awareness, training or policy changes. ACC currently collects and conducts MFOQA analysis on data for the F-16 BLK50/52, MQ-9, HC/MC-130J, and RC-135, and will begin on the HH-60 very soon.

Line Operations Safety Audit (LOSA) uses trained MDS *observers* (not a check ride) to accompany aircrew during actual missions to observe operations "in the field" and record procedures, techniques, and errors. LOSA is used extensively in the airlines and AMC, and ACC is proud to announce our first LOSA contract for the MQ-9 (GCS) was awarded in September 2016 for spring 2017 implementation.

Airman Safety Action Program (ASAP) is an identity-protected, non-punitive program that allows *anyone* to highlight a hazardous situation, unintentional error or hidden risk. This tool allows each and every Airman to be a sensor for safety, and offers tremendous potential for identifying and mitigating hazards in every corner of our operations around the world. It's easy, voluntary, non-punitive, and just might save a life. ASAP reports can be viewed at http://safety-masap.com or submitted from any mobile device (no app required) at https://asap.safety.af.mil.

Proactive and reactive safety measures are both part of a healthy safety culture and assist in identifying and mitigating hazards, but we can't prioritize or fix what we don't know about! Of all the proactive safety programs above, ASAP is truly in your hands and allows grass-roots contributions to safety at all levels. Still not sure? Visit these sites, look at the scoreboard—see it for yourself and then tell us *what you see* out there.

F22

Demonstration Team

BY MAJ. DAN "ROCK" DICKINSON

Since 2007, the United States Air Force F-22 Demonstration Team has been showcasing the superior maneuvering capabilities of the world's most advanced 5th-generation combat fighter. Through a 19-member team made up of the Air Force's sharpest Airmen, the F-22 Raptor's advanced flight controls and powerful Pratt & Whitney F119-PW-100 thrust vectoring engines are put to work defying typical flight characteristics through the Raptor's post-stall maneuvering capabilities. Operating this $143 million national asset close to the ground, and at times completely "stalled out," requires an extremely high margin of safety—not only for the aircraft, but more importantly, for the safety of the spectators.

The process for ensuring a safe demonstration is a building block approach similar to most other Air Force training plans beginning well prior to the show season of March through November—and it all starts with academics. Flying aircraft at an airshow first requires a fundamental understanding of the flying category lines or "show lines," which dictate the required distance from the crowd for aerobatic maneuvers to be flown. These show lines plus corner markers, crowd center markers, and the aerobatic container are all designed to bring the highest degree of safety possible for the public, while still balancing the ability of the pilots to showcase the aircraft to the crowd. The fact that these lines and markers are completely different at every airshow venue presents an additional challenge and highlights the importance of prior mission planning.

Photo by: Senior Airman Kayla Newman

Photo by: 1st Lieutenant Mahalia Frost

Another focus of the F-22 Demonstration Team's training plan is safely handling inflight system problems that could potentially arise during the sortie. Operating any aircraft low to the ground creates an increased level of complexity, especially when a problem such as an engine failure or a flight control issue arises. While extremely rare in the F-22 Raptor, almost every possible emergency is rehearsed multiple times throughout the demonstration profile to ensure each maneuver is flown at an altitude high enough to allow the pilot to recover the aircraft, 100 percent of the time, even if an engine fails.

Once academics and simulator training are complete, training in the aircraft begins with an initial 5,000 ft above ground level (AGL) floor, which is slowly decreased to the target altitude of 300 ft, and then to the minimum altitude of 200 ft, over approximately 10 sorties as confidence and proficiency increase. In terms of the demonstration profile itself, every maneuver is explicitly spelled out in our governing Air Force Instruction to include target airspeed and altitude parameters, as well as minimum parameters. Furthermore, the altimeter is almost always zero' d out at the airshow site, which results in the same altitude parameters no matter the airport's elevation, barring a high-density show site. This makes it significantly easier for the pilot to memorize a set of parameters to be used at every show, as opposed to constantly changing altitudes to account for different field elevations.

Another critical member of the F-22 Demonstration Team is the safety observer (SO). Each year, six combat qualified F-22 pilots are selected to join the team, rotating between 20+ airshows throughout the season, with the goal of adding an extra level of safety for the team. The SO works with the Airboss and is in direct communication with the aircraft throughout the demonstration sequence. Feedback is provided during a number of maneuvers, which require a challenge and response confirmation of altitude and airspeed prior to execution. The SO monitors not only the demonstration, but also the entire venue for hazards such as birds, drones, and other aircraft that could pose a threat to the safe execution of the sortie. While the SO is not airborne per se, he or she is still acting as a wingman or #2, and always has a free "knock-it-off" call on the radio for anything that is deemed unsafe.

Ensuring that the aircraft is ready to fly is another critical factor in executing a safe demonstration, and this is where our F-22 Demo Team maintainers come into play. Competitively selected from the best of the best Raptor maintainers at Langley Air Force Base, these eight high-caliber maintainers take on the responsibility of ensuring the F-22 Raptor is ready for the high-G, near supersonic, low altitude demonstration. One of the many challenges faced by these crew chiefs, avionics, and weapons specialists is dealing with limited support equipment on the road in challenging environments—and in this, they truly excel. Just like the SO, each team member holds a "knock-it-off" card, and I trust them with my life when they tell me the jet is ready to go.

Photo by: 1st Lieutenant Mahalia Frost

Last, but not least, the Demo Team Aircrew Flight Equipment (AFE) specialist adds a further margin of safety by ensuring the flight and survival equipment is ready for the sortie. Specifically, the Advanced Technology Anti-G Suit or ATAGS is absolutely mission -critical for withstanding up to 9.5Gs throughout the Raptor demonstration.

It takes an entire team to ensure every F-22 demonstration is executed safely in an environment with zero room for error. From the pilot flying the aircraft to the crew chiefs ensuring the jet is ready to go, each person works together to showcase the Raptor to the public in hopes of inspiring the next generation of Airmen to serve our great country.

Photo by: Senior Airman Kimberly Nagle

Trust & Know your Oxygen System

Chief of Staff of the Air Force
Vector 13 Sep 2016

1. Identify touchpoints in the training pipeline between UPT, FTU, and the ops squadron where newly qualified aircrew can be trained to recognize and recover from both hypoxia and hypocapnia (prevention, recognition, and treatment), and make the recovery procedure a BOLDFACE item in all MWS Dash-1s.
2. Consider how to best balance available training resources (altitude chambers, ROBD devices, etc.) to prioritize getting at-risk aircrew (fighter-assigned aircrew) updated physiologic training within the next year.
3. Identify risk factors that increase the likelihood of developing hypocapnia and ways to reduce these risks. Specifically, consider overall health and fitness strategies and in-flight training strategies.

BY COL. BILL MUELLER

Col Mueller is the Director of the USAF Pilot-Physician Program and served as the Deputy Team Lead for the CSAF-directed Independent Review Team of F-15C Physiologic Incidents in 2016.

"Trust your instruments" This well-known saying is burned into the minds of every military aviator as the key principle for safely flying in IFR conditions. Its importance is obvious because flying by "the seat of your pants" in IFR conditions will quickly lead to a mishap. The attitude indicator reliably shows the aircraft's position in the air, and the associated performance instruments depict airspeed, altitude, and heading. As easy as this may sound, aviators know that 'trusting your instruments' when experiencing the 'leans' can be a real challenge.

"Trust your life support system" This concept is just as important as trusting your instruments. However, unlike the control and performance instruments in your cockpit, there are few ways to verify the proper operation of an aircraft oxygen system. Therefore, aircrew are given physiology training that exposes them to various in-flight risks and teaches us how to prevent, recognize, and recover from these risks. One of these risks is hypoxia—a situation where not enough oxygen is delivered to the brain. Aircrew are trained to recognize their hypoxia symptoms by either exposing them to a hypobaric (low pressure) atmosphere in the "altitude chamber" or by reducing the oxygen mixture in a "Reduced Oxygen Breathing Device/ Chamber." However, as depicted in Figure 1, many conditions can cause "hypoxia-like" symptoms.

This article will review an underappreciated cause of physiologic symptoms known as ***hypocapnia***, and explain why a recent review of F-15C physiologic incidents by a CSAF-designated Independent Review Team (IRT) found good reason for aircrew to:

1. Trust their oxygen system
2. Better understand Hypocapnia
3. Take corrective actions for both Hypoxia ***and*** Hypocapnia if they notice "hypoxia-like" symptoms

First and foremost—like any other aircraft system, aircrew must understand their oxygen system and how it is designed to perform in normal and degraded conditions. In the F-15C, the CRU-98 regulator converts a liquid oxygen supply to gaseous oxygen, and then adjusts the mixture and delivery pressure of the oxygen to maintain a sea level equivalent oxygen concentration (known as partial pressure) to the lungs. This level is depicted by the yellow line in Figure 2, which represents the sea-level partial pressure of oxygen - 103 mmHg. Starting with a 21 percent mixture at sea level, the concentration of oxygen must be increased to 100 percent at 35,000' cabin altitude to maintain this partial pressure of oxygen in the lungs. Above 35,000', pressure is added to the 100 percent oxygen mix to maintain this level. Known as "Pressure Breathing for Altitude" (PBA), this added pressure requires aircrew to reverse their normal breathing pattern—relaxing to inhale, and exerting force to exhale. It is generally agreed that hypoxia can begin to occur at a partial pressure of 60 mmHg (Depicted by the orange line—10,000' MSL equivalent), and rapid incapacitation will occur at 30 mmHg (Depicted by the red line—25,000' MSL equivalent).

Under normal conditions, the CRU-98 regulator is designed to operate between the blue and green lines, supplying oxygen at levels well-above the sea level equivalent. The black containers in the diagram depict the engineering test parameters used to verify performance of the CRU-98 regulator between minimum and maximum specifications. The green arrows on top of the black containers depict the designed failure direction for the mechanical components of the regulator—up and ***away*** from the hypoxia lines. In summary, the normal operation of the CRU-98 supplies oxygen well-above a sea level equivalent, and as regulator components degrade, the CRU-98 is designed to supply even ***more*** oxygen than required.

Every 180 days, Electro-Environmental maintainers use a field test device to measure the performance of CRU-98 regulators.

Medical Causes of Physiologic Symptoms

Symptoms	Hypoxia	Hypocapnia	Hypercapnia	Dehydration	Toxic Exposure	Hypoglycemia
Dizziness	X	X	X	X	X	X
Cognitive Impairment	X	X	X	X	X	X
Tingling/Cold Extremities	X	X	X	X	X	X
Fatigue	X	X	X	X	X	X
Headache	X	X	X	X	X	X
Light Headedness	X	X		X	X	X
Nausea	X	X	X	X	X	X
Visual Disturbances	X		X		X	X
Rolling/Tumbling	X	X				

Figure 1

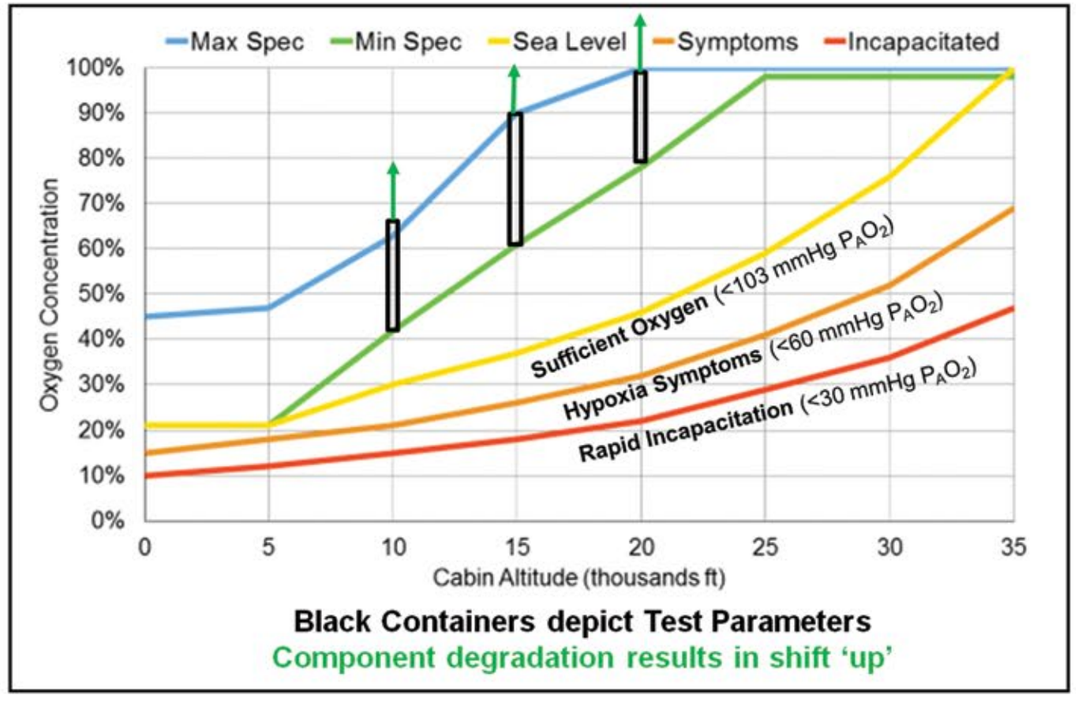


Figure 2: Operation of CRU-98 Regulator vs Oxygen Requirements

Field testing is designed to identify, remove, and replace regulators that fall outside engineering parameters depicted by the black containers in Figure 2. Regulators that 'fail' the field test are sent to the USAF Air Logistics Center (ALC) in Oklahoma City for higher fidelity testing and refurbishment. Since 2014, the ALC has measured and plotted oxygen levels for these field test failures. The results are depicted in Figure 3 and demonstrate that most regulators failing field tests actually met engineering specifications, and "out-of-spec" regulators generally failed in a "positive" direction, delivering more oxygen than designed. No tests ever found oxygen level delivery below the sea level equivalent.


Photo by: Senior Airman Maeson L. Elleman

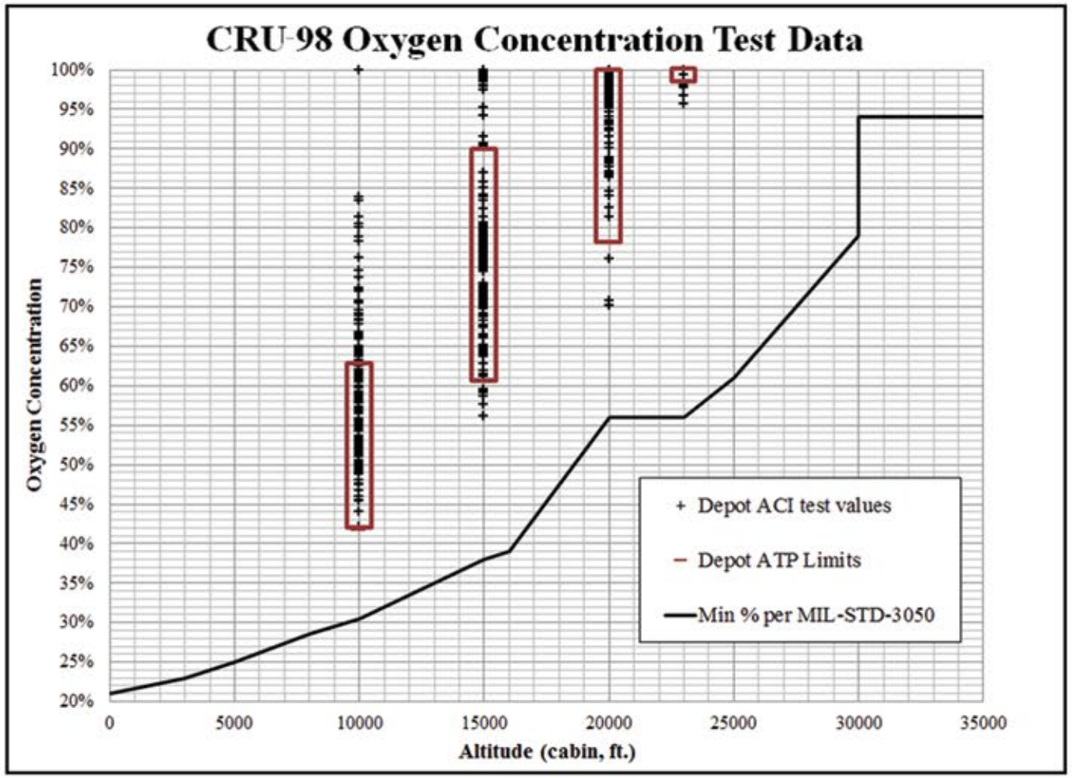


Figure 3: CRU-98 Performance Test Results

This data, as well as a thorough review of Class E physiologic reports, Class A mishap reports, and an assessment of oxygen system components, led the IRT to conclude that the F-15's oxygen system can be trusted to deliver safe levels of oxygen to aircrew in all phases of flight as long as the Aircrew Flight Equipment (AFE) is properly worn, connected, and used.

In light of this finding, other conditions listed in Figure 1 were considered as possible causes of the hypoxia-like symptoms. One condition—hypocapnia—was the physiologic condition that contributed to the F-22 stand-down in 2012. This condition results when a person exhales more carbon dioxide (CO_2) than physiologically necessary. Excessive CO_2 loss shifts the pH balance in the blood, making it more alkaline and constricting blood vessels. This "vasoconstriction" reduces blood flow to the brain and extremities, and therefore, causes the same symptoms as hypoxia.

In the F-22's case, increased work of breathing from AFE gear and an out-of-spec upper G-garment valve were thought to have caused some pilots to unknowingly breath faster and shallower. Over time, increased breathing rates cause excess CO_2 to be 'blown off', resulting in hypocapnia and physiologic symptoms that mimic hypoxia. Fixing the valve and ensuring AFE was properly fitted reduced the work of breathing and eliminated the physiologic symptoms.

In the F-15's case, there was a strong correlation between physiologic incidents and loss of cockpit pressure. During its investigation, the IRT learned that there are technical and scientific associations between cockpit pressure and the rate of CO_2 loss. At a cabin altitude of 18,000', where atmospheric pressure is half that of sea level, the rate of CO_2 loss may be as much as doubled even with normal respiratory rates. This puts aircrew closer to a hypocapnia threshold that can cause physiologic symptoms which mimic hypoxia. Moreover, this rate of loss is amplified during mission profiles requiring rapid ascent and/or significant radio communications.

The F-15 IRT also learned that "reducing rate and depth of breathing" was no longer part of checklist and Dash-1 corrective actions for recovering from a physiologic incident. Since this is the only action that will reverse the CO_2 loss and correct for hypocapnia, aircrew will continue to experience hypocapnia symptoms if the correct steps are not applied. Even when steps are properly applied, symptoms from hypocapnia take longer to resolve than expected due to the pH shifts that have already occurred.

Given the lack of instrumentation to measure inhaled oxygen or exhaled CO_2, it is impossible for aircrew to differentiate between hypoxia, hypocapnia, and the other conditions listed in Figure 1 that could cause hypoxia-like symptoms. Therefore, it is critical to gang-load their regulator (or the MWS equivalent of 100 percent/Emergency oxygen delivery), descend, and reduce rate and depth of breathing for any physiologic EP. Knowledge of and trust in the oxygen system should give aircrew confidence that they are receiving enough oxygen, and that symptoms will resolve as CO_2 and pH levels return to normal.

Lt. Col. Jay Flottmann, pilot physician and 325th Fighter Wing Chief of Flight Safety, explains how a valve in the upper pressure garment and the shape and the size of oxygen delivery hoses and connection points contributed to previously unexplained physiological issues during F-22 flights. (Photo by: Senior Airman Christina Brownlow)

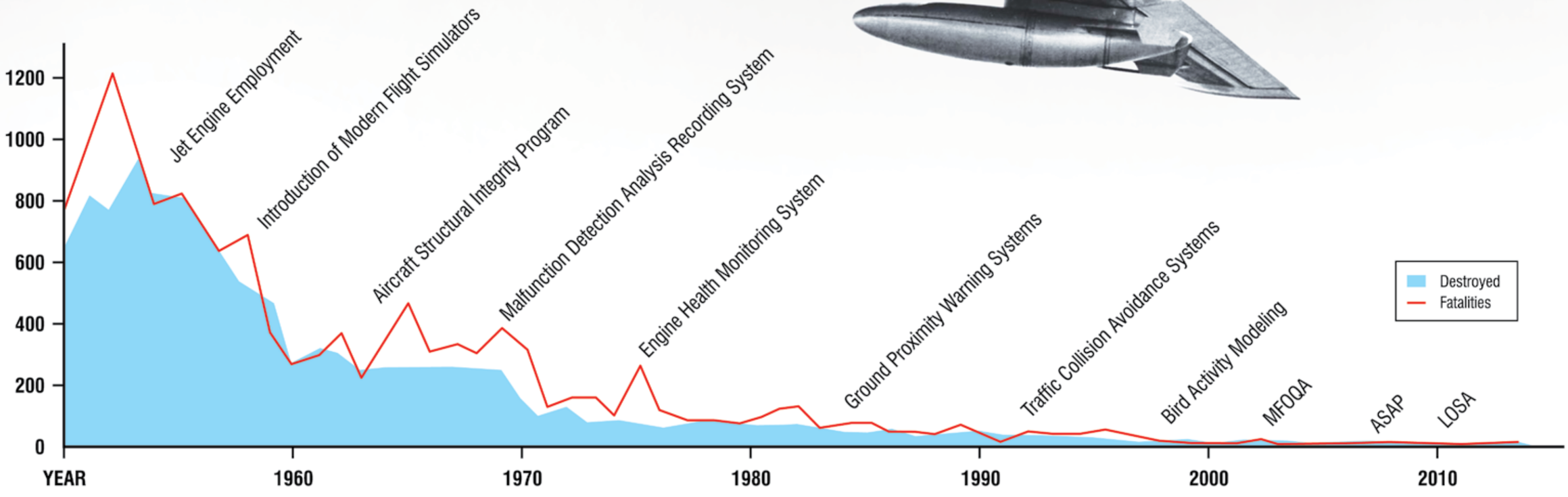
As the Air Force continues to operate in extreme flight regimes, it has become more imperative to develop "Performance Instruments" that monitor both the aircraft oxygen system and individual crew members. Such instruments would confirm the performance of life support systems and optimize aircrew performance. Until that time though, aircrew must understand, trust, and use their oxygen system correctly, and know how to correct for both hypoxia and hypocapnia if physiological symptoms occur. As the CSAF emphasized in his F-15 IRT out-brief comments, we must refocus our efforts and know that hypoxia training alone is not sufficient to protect our valuable aircrew—we must engage on multiple fronts to ensure they have appropriate knowledge and training to prevent the next physiological incident.

CAF Flight Safety

The Next Level (Part I)

BY COL. STEVEN G. OWEN

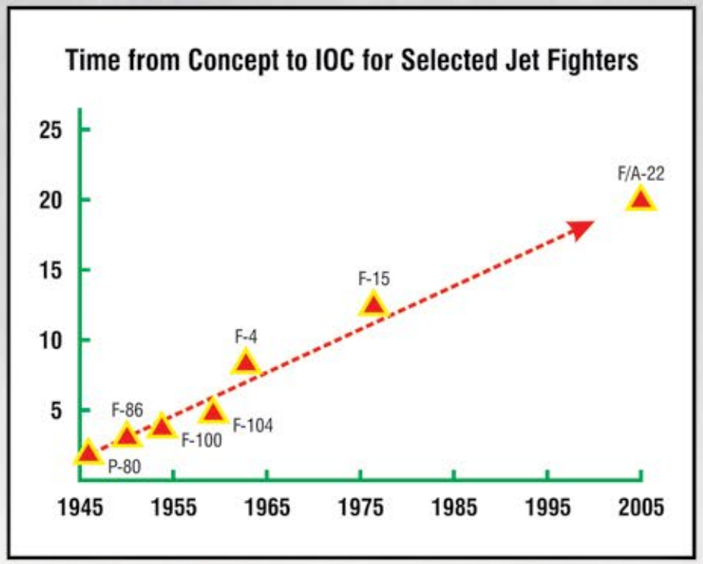
When you think of measuring the success of our Air Force flight safety programs, what metrics come to mind? How many times have you gone to your Squadron, Group or Wing Quarterly Safety meeting and heard about the latest reduction in overall mishap rates? Have you ever wondered how these numbers compare to our early days as an Air Force? If you look back at historical mishap rates, the Air Force hit a high of 1,214 fatalities in 1952 with 789 aircraft destroyed.



Since then, multiple improvements in technology, training, policies and procedures have driven Air Force aviation mishap rates below two mishaps for every 100,000 flight hours. ACC lost three manned aircraft and two of our Airmen in 2015. When you factor in various risk drivers over the last 20 years, such as increased ops tempo and reduced force structure, this reduction in overall mishap rates is an incredible accomplishment. While it would be tempting to say that "we have arrived" as a Combat Air Force when it comes to managing aviation risk, changes in the future operating environment provide added incentive to stay the course and seek out opportunities for continuous improvement.

The current ACC Strategy, "Securing the High Ground" outlines some significant challenges that must be considered in preparing for the future operating environment. Many of our potential adversaries are "developing or acquiring Anti-Access and Area Denial (A2/AD) capabilities to challenge our ability to assure freedom of maneuver." Additionally, "rapidly emerging technological breakthroughs could serve as game-changers for either friend or foe." On the domestic front, "the US national debt and associated fiscal repercussions, combined with two decades of sustained combat operations, have imposed tremendous stress on our Airmen and equipment."

From sensor fusion technology to stealth and super cruise, ACC's 5th generation aircraft provide a significant advantage to maintain the Air Force's core function of Air Superiority in an A2/AD environment. However, from a human factors perspective, there are always new challenges with new technologies. For example, when the Joint Helmet Mounted Cuing Sight (JHMCS) first came out in the F-15C community, the increased capability to target a bandit with the off-boresight capability of the helmet during an ACM engagement presented a new temptation to over-fixate on the bandit, resulting in spatial disorientation or loss of situational awareness (i.e. pointing at the water in full-AB while rapidly approaching the floor). The increased sensor capabilities of our 5th generation aircraft have provided remarkable improvements in situational awareness, but have also presented a potential for future human factors errors due to changes in cockpit workload and continuous adaptation to evolving technologies.



Source: M. Knaack, *Post-World War II Fighters* (Washington, D.C.: USAF, 1986); some data from SAF/PA. Courtesy Dr. R. P. Hallion

Additionally, as the capabilities of our 4th and 5th generation aircraft have increased exponentially over the last two decades, so have the costs and time from inception to initial operating capability. For example, in 1945, the US government spent approximately $60,000 for one P-51 mustang, arguably one of the greatest tactical fighters in the history of aviation. In 2015 dollars, that same P-51 would cost approximately $700,000. By comparison, in 1998 a single F-16C cost approximately $20 million and an F-15E cost approximately $30 million. For 5th generation aircraft, a single F-22A costs approximately $143 million. As such, the cost of aviation mishaps is increasing exponentially as well.

Finally, if you look back at the historical inventory of CAF aircraft, our numbers have been steadily decreasing. By 1946, the Army Air Corps had produced over 15,000 P-51s. One lost aircraft could easily be replaced due to the size of the overall inventory and the relative simplicity of the design. In 1985, Tactical Air Command had a fighter fleet of over 2,000 aircraft including 466 F-15s, 527 F-16s, 285 A-10s, 388 F-4s, and 124 F-111s. Today, the CAF has 413 F-16s, 95 F-15C/Ds, 213 F-15Es, 142 A-10s, 162 F-22s, and 36 F-35s for a total of 1,061 fighter aircraft across ACC, USAFE and PACAF. If you look specifically at the projected numbers for our 5th generation fleet, it becomes clear that the loss of a single aircraft, with such advanced technology, has a much larger impact on our total combat power and cannot be easily replaced. This combination of increasing complexity, increasing costs, smaller aircraft inventories, and increasing fiscal constraints requires the CAF safety enterprise to continuously evolve in order to preserve combat power and prepare for the future. We have slowly moved from substantial quantity with superior technology towards lower aircraft numbers with exquisite technology—each airframe is truly a national asset. While we will never be able to achieve a mishap rate of zero, the mission impact of losing a single aircraft outside of a combat environment requires all of us to elevate our aviation mishap prevention to a whole new level.

The next level of CAF aviation safety maintains the current safety investigation programs defined by AFI 91-204 but integrates proactive safety programs as well. On 26 January 2015, the Air Force Safety Center published AFI 91-225 "Aviation Safety Programs." This AFI focuses on three interrelated programs designed to drive mishap rates even lower than they are today. The first of these programs is Military Flight Operations Quality Assurance (MFOQA). The MFOQA program utilizes flight data from aircraft flight data recording systems to track trends in aircraft and aircrew performance. This data is collected by the MXG, downloaded to a central database, and then reviewed by contract MDS analysts to provide trend analysis and feedback to the operators at the wing and group levels. For ACC, MFOQA data is already being utilized within the MQ-9, RC-135, HH-60, RC-135, HC-130J and a small cross section of the F-16 communities. A new FDR/DVR combo within the F-15 community is underway that will enable the collection of MFOQA data in FY 17 and plans to include the F-22 community are underway as well.

The MFOQA program was originally developed to provide trend analysis and support to the civil aviation industry and has become an integral part of Air Mobility Command's safety program. As such, much of the data collected in the early stages of MFOQA has focused on analyzing "unstable approach" and landing criteria. For example, the initial implementation of MFOQA on our appropriately instrumented F-16s revealed a trend for pilots to fly fast approaches and/or land long. As a fighter guy, my initial reaction to this data was, "So what? Most of us in the fighter community fly visual overhead approaches with a lot of variables involved. As long as I can put it down on speed in the first 1,000 feet, I'm good. I don't need some data analyst telling me how to fly my jet." Wrong answer! By correlating the MFOQA data with recent mishap trends, ACC identified at least three F-16 mishaps that were a direct result of not only flying fast approaches, ***but landing long and fast*** as well. If we had identified this trend and gotten the word out earlier, these mishaps could have been prevented; preserving scarce resources to deliver devastating combat power where it matters most … in the AOR!

The next level for CAF aviation safety is to take advantage of proactive safety capabilities such as MFOQA and tailor them to our missions and analytical purposes. The increased capabilities and system monitoring of our aircraft bring greater combat capability but also increased flight data that we can use to prevent mishaps and improve operations. The benefit of MFOQA data is that it provides you, the tactical operator, with the ability to tailor and track specific performance factors that matter the most to your MDS. We need to leverage that data to identify and counter hazardous trends in the CAF. If you could measure various flight parameters within your particular MDS and track those parameters over time to identify potential hazards, what would you measure? Would you keep the stable approach criteria, but also increase your focus on range operations? Would you drop the stable approach criteria and focus more on BFM/ACM? This is your program … tell us what you think! As we progress through Part II and Part III of this series, we'll focus in on how two interrelated components of proactive safety, ASAP and LOSA, combine with MFOQA to build upon and strengthen our mishap prevention programs.

Until next time … Fly Safe!

~ Grit

File an ASAP Today!

Taken from an actual ASAP submission.
This event did not result in a mishap, but provides valuable information worthy of sharing.

ASAP # 108: F-16C/D Uncommanded/Unintended departure from controlled flight

Description: The incident occurred on the final 3K of an IPUG-1 (OBFM). The fight progressed to the floor, and resulted in a stack. During the stack, the horn was momentarily entered and exited. With range opening between myself and the offender, I released G to place lift vector on the adversary to reduce the opening range. I pulled to the limiter once lift vector was set (at 80 degrees of bank), and began reducing range to the offender. Once LOS was again frozen, I attempted to reset lift vector to perpendicular to the horizon but did not properly unload the jet—assaulting multiple limiters at a slow airspeed (94 knots and 80 degrees of bank at 10,930 ft. MSL). The jet departed controlled flight as a result of the control input. I accomplished the first portion of the out of control CAPS (controls release + throttle IDLE), and the jet began to recover approximately 9 seconds later. The jet returned to a flyable condition (130 knots, 38 degrees nose low) at 9,680 MSL (approx. 7,200 AGL). A KIO was called during the out-of-control situation, and an RTB was initiated immediately following the event.

Reaction: The incident was assessed to be a pilot-induced condition and not a jet condition. Following the recovery, FLCS malfunctions were cleared up and the jet was showing no degradation. A BD check was accomplished on RTB (NSTR) and the flight came back to the field for a precautionary straight in with #1 in chase. The recovery, landing, and taxi-back to shut down all had nothing significant to report.

Suggestions: At slow speeds, only apply one control application at a time to avoid assaulting multiple limiters.

Resolution: Your willingness as a highly experienced Viper Driver to share this event with your fellow Airmen is exactly what the ASAP program was designed for. Hopefully, by sharing this event, some of our less experienced Viper Drivers will be able to better understand the handling characteristics of the F-16 during a slow speed/High AOA engagement, and prevent future out of control events that could lead to a Class-A mishap. This is a great topic for future SQ safety meetings. We will keep this ASAP on file for future trend analysis and to provide a data point for other F-16 safety offices to reference as they continue to refine their flight safety programs.

Do you have a lesson learned to share?
http://safety-masap.com

ASAP—Aviation Safety Action Program ...
It's confidential and quick

Photo by: Senior Airman Solomon Cook

FUNDAMENTALS FOCUS

BOTOTCHA

Bombs on Target, On Time, Come Home Alive!

As combat aviators, we know our business can be dangerous. We work tremendously hard to be the best at employing our weapon systems, to hone our tactics and deliver devastating firepower or unparalleled combat capability while keeping our aircraft, our crews and our supported forces safe. With steely-eyed focus and professionalism at every step of the way, we brief, step and fly. Yet, an often unrecognized threat looms at the end of the mission—inattention during RTB.

A surprising 73 percent of aviation Class A mishaps from the last two years occurred during admin phases of flight and more than half of those during RTB. Despite the immense complexity and hazards associated with our combat missions, it is basic phases of flight such as takeoff and landing when the majority of our major aviation mishaps occur. Some mishaps are triggered by system failures but others are initiated by momentary lapses in situational awareness or task prioritization. These are the silent threats that can lead to preventable mishaps which unfortunately claim the loss of combat assets and even loss of life.

How can it happen? Perhaps during the transition from tactical to recovery phase of flight, contracts are less clear but the formation is not yet in a standard position and jets collide while attempting to rejoin. Or, during landing, the contract to clear cold is not executed promptly or excess speed eliminates the planned landing spacing. Finally, landing gear can collapse on touchdown or nosewheel steering can fail without warning. In all of these circumstances, aircrew RTB their aircraft with no detected malfunctions and a mishap occurs during the final phase of flight.

In my flying community, we often summarized our mission objectives as BOTOTCHA—Bombs on Target, On Time, Come Home Alive! While getting home alive focused on executing defensive tactics effectively to defeat threats, it also meant completing a safe recovery to base. After fighting through a complex tactical scenario, keep your focus sharp and reward yourself with a safe flight home through final landing.

Photo by: Staff Sgt. J.D. Strong II

MAINTENANCE MINUTE

When does routine become NOT ROUTINE

BY MASTER SGT. JEFFREY STULL

When you think about routine maintenance, what comes to mind? An inspection? Refueling an aircraft? Do you consider the small tasks that comprise a more difficult task as "routine" maintenance actions? Small tasks such as tightening a fuel line, or properly securing an aircraft panel for flight are all routine maintenance actions that get accomplished every day. These small maintenance actions can also have the greatest consequences if not properly performed. Take for example the removal of an APU on a fighter aircraft to fix a hydraulic leak. Maintainers successfully fixed the hydraulic leak and installed the APU. However, when they installed the APU, one of the maintainers failed to properly connect a fuel line completely. It operated fine for more than two weeks until the operation and vibration of the APU caused the line to become disconnected during ground maintenance. A small contained fire developed because of the disconnected fuel line which caused $131,000 damage to the aircraft. Such a small routine maintenance task completed incorrectly led to a Class C aircraft mishap.

Take another example of an egress maintenance crew performing aircraft ejection seat removal maintenance. The team conducted a pre-use inspection on a collapsible crane which is used to remove the aircraft ejection seats. However, the team failed to identify a missing winch handle retaining pin. While attempting to raise the crane hook assembly into position, rotational inertia disengaged the winch handle from the crane and lobbed it into the air. The handle bounced off a covered aircraft canopy in the area and caused $170,000 damage to the canopy. Another routine task that became part of a Class C mishap sequence.

Routine tasks may garner some comments like, "I do that every day, I don't need to refer to the job guide." However, overconfidence in the ability to complete "routine" tasks leads to complacency. This can cause a very capable maintainer to overlook even the smallest "routine" task, resulting in damaged equipment, lost aircraft, or even worse, the loss of a valuable Air Force Team member. As maintainers, we need to focus on these basic routine tasks, as they are the building blocks on which more critical maintenance tasks rest. Focus on proper completion of routine MX tasks sets the foundation for preventing "unscheduled" MX tasks and mitigating potential mishaps. This provides more time, people and aircraft to focus on our mission to deliver combat air power.

Photo by: Staff Sgt. Katherine Spessa

WEAPONS WORDS

HERO

BY MASTER SGT. DAVID INGRAM

What is the first thing that comes to mind when I say hero?

You may think of a mother or father; or someone who has positively impacted your life; a Good Samaritan or maybe even a super powered cartoon character. A hero normally sacrifices their personal concerns for a greater good.




In the safety world H.E.R.O. means "Hazards of Electromagnetic Radiation to Ordnance."

This term encompasses the dangers of accidently initiating explosive devices with electromagnetic energy, which comes from items such as: wireless computers, tablets, radio transmitters, barcode readers, key fobs, and network access points. These devices have **safe separation distances** to explosives. Make sure you know what they are before you put these items to use around explosive items. Be a hero by exhibiting selfless acts to protect those around you.

MONTHLY AWARDS

Aircrew Safety Awards of Distinction

Ronin 80 Crew – 82 ATRS, 55 WG, Offutt AFB NE *(December 2016)*
Python 86 Crew – 340 EARS, 379 AEW, Al Udeid AB, Qatar *(January 2017)*

Crew Chief Safety Awards of Distinction

SrA Jesse A. Hunt – 4 AMXS, 4 FW, Seymour Johnson AFB NC *(November 2016)*
SrA Spencer J. Watson – 4 AMXS, 4 FW, Seymour Johnson AFB NC *(January 2017)*

Flight Line Safety Awards of Distinction

TSgt Kyle D. Salter – 455 EAMXS, 455 AEW, Bagram AB, Afghanistan *(December 2016)*
SSgt William Bennett – 332 EMXS, 332 AEW, Diyarbakir AB, Turkey *(January 2017)*

Occupational Safety Awards of Distinction

Maj Christina A. Norton – 439 AEAS, 438 AEW, Kabal, Afghanistan *(November 2016)*
SSgt Trevor A. Drake – 380 EAMXS, 380 AEW, Al Dhafra AB, UAE *(January 2017)*

Pilot Safety Awards of Distinction

Capt Michael J. Sayers – 95 FS, 325 FW, Tyndall AFB FL *(November 2016)*
Mr. James J. Harkins, Jr. – 82 ATRS, 53 WG, Holloman AFB NM *(December 2016)*
Capt Ely F. Smith – 380 EAMXS, 380 AEW, Al Dhafra AB, UAE *(January 2017)*

Unit Safety Awards of Distinction

23rd Medical Group Pharmacy – 23 WG, Moody AFB GA *(November 2016)*
332nd Expeditionary Civil Engineer Squadron – 332 AEW, MSAB, Jordan *(January 2017)*

Weapons Safety Awards of Distinction

Amn Brittany M. Wade – 355 AMXS, 355 FW, Davis-Monthan AFB AZ *(November 2016)*
EOD Response Team – 325 CES, 325 FW, Tyndall AFB FL *(January 2017)*

QUARTERLY AWARDS

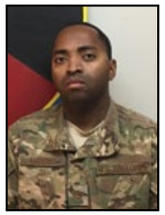
Flight Safety

Capt Robert Hetherington, 46 ERS, 386 AEW, Ali Al Salem AB, Kuwait. During one severe emergency, an aircraft with a complete loss of coolant led to the engine overheating. After gaining control of the aircraft from the MCE, Capt Hetherington descended directly to High Key for a precautionary overhead engine flame out (EFO) pattern. Prioritizing checklists and getting priority routing from ATC proved to be the difference maker in safely recovering the aircraft. On another emergency, he experienced reduced thrust immediately after takeoff during initial climb out. Quickly noticing the reduced engine performance, a turbocharger failure was diagnosed. Understanding he would be unable to go around on this approach he entered a precautionary EFO pattern and performed a full-stop heavyweight landing without issue. During yet another critical emergency, he safely recovered an aircraft with a catastrophic oil leak. With oil pressure dropping well below normal range, he was able to lead the crew through all emergency checklists, assess the challenging wind effects from the up to 30 knot gusts throughout the emergency pattern, and ensure the heavyweight aircraft landed safely. He also recovered an aircraft when an autopilot/navigation sensor failed. Capt Hetherington was able to safely land the aircraft at max allowable cross wind limits. Expert systems knowledge, exceptional CRM, and decisive actions were critical in preventing multiple aircraft mishaps saving $27M in CFACC combat assets.

Occupational Safety

SrA Jacob L. DelTedesco, 23 CMS, 23 WG, Moody AFB GA. Senior Airman DelTedesco was tasked to prepare five right hand throttle grip assemblies, from base supply, for initial issue during the month of July 2016. As he was performing a routine functional check on the grips, specifically on the grip assembly slews, he began noticing a high failure rate alignment trend. A slight deviation in the slew system on the hand grip will adversely affect an A-10 pilot's ability to navigate and track targets provided by ground commanders during close air support missions. Exacting calibration is crucial to preventing an inadvertent and potentially lethal friendly fire scenario. Refusing to accept the status quo and condemning a 13 thousand dollar part that was within his shop's ability to repair, he reached out to the Depot facility technicians to rationalize technical order procedures and drawings. He revealed conflicting criteria between depot and the field manuals causing slew deviations on the grip assembly, in which Depot agreed. SrA DelTedesco authored and submitted an AFTO 22 to correct the technical guidance error. His action was the catalyst for fleet-wide A-10 field level repair capabilities. Within 23 CMS's Electro-Environmental section, his shop has thus far saved the Air Force more than 377 thousand dollars in supply procurement costs.

Weapons Safety



TSgt Terrance C. Harris, 442 EAS, 455 AEW, Kandahar AB, Afghanistan. TSgt Harris, Munitions and Weapons Advisor, over the last quarter has continued to develop and enhance safety procedures in the Afghan Air Force's Kandahar Air Wing. One such significant contribution was discovering and correcting a critical jamming trend on Mi-17 door-mounted M240 machine guns. After inspecting all weapons, he identified worn gears and missing ejector pins as a root cause and poor cleaning procedures as a contributing factor. To correct these problems he created an M240 course which included cleaning, repairing, and malfunction procedures, techniques, and practices. The training included a slideshow translated to Dari as well as a hands-on portion. The course was attended by eight Afghan Air Force armament maintainers and two Mi-17 Aerial Gunners. TSgt Harris' course reduced M240 jamming significantly and eliminated $147K in potential weapon replacement costs. TSgt Harris played a pivotal role in mapping out a location and assisting with the construction of an on-ramp Earth Covered Magazine storage facility for rockets. Previously, they were stored in an unventilated and unprotected CONEX. The new storage facility increased protection from outside rocket attacks, reduced risks from internal explosions, and reduced travel time for delivery by 80 percent.

Congratulations

FY 2016 Air Combat Command Safety Award Winners

ACC OUTSTANDING AIRMANSHIP AWARD
Capt Mark Q. Kuhn
42 ATKS, 432 WG, Creech AFB NV

ACC SAFETY SPECIAL ACHIEVEMENT AWARD
Capt Kyle M. Schafer
57 WG, Nellis AFB NV

ACC SAFETY CAREER PROFESSIONAL OF THE YEAR AWARD
TSgt Roger A. Scott
55 WG, Offutt AFB NE

ACC CHIEF OF SAFETY OUTSTANDING ACHIEVEMENT AWARD FOR WEAPONS SAFETY
MSgt Valentine Caldera
325 FW, Tyndall AFB FL

ACC CHIEF OF SAFETY OUTSTANDING ACHIEVEMENT AWARD FOR GROUND SAFETY
Cat II – 633 ABW, JB Langley-Eustis VA
Cat IV – 552 ACW, Tinker AFB OK

ACC OUTSTANDING AIRCREW AWARD
Python 96 Crew
Maj Daniel S. Hoak
MSgt Martin R. Siler
Lt Col Michael L. Kirkman
Lt Col David J. Drass
A1C Matthew K. Ogden
SSgt Nicholas A. Deubell
16 ACCS, 461 ACW, Robins AFB GA

ACC AVIATION MAINTENANCE SAFETY AWARD
9 MXS Accessories Flight
9 RW, Beale AFB CA

ACC CHIEF OF SAFETY CYBER SAFETY AWARD
9 CS, 9 RW, Beale AFB CA

COMMANDER'S AWARD FOR SAFETY
9 AF – AFCENT
Shaw AFB SC

WING SAFETY PROGRAM OF THE YEAR
380 AEW, Al Dhafra AB, UAE

WING CHIEF OF SAFETY OF THE YEAR
Lt Col Paul T. Davidson
57 WG, Nellis AFB NV

FLIGHT SAFETY OFFICER OF THE YEAR
Capt Kyle M. Schafer
57 WG, Nellis AFB NV

FLIGHT SAFETY NCO OF THE YEAR
TSgt Gregory R. Hernandez
552 ACW, Tinker AFB OK

FLIGHT LINE SAFETY OUTSTANDING ACHIEVEMENT AWARD
SMSgt David A. Dickens, Jr.
9 MXS, 9 RW, Beale AFB CA

WEAPONS SAFETY OUTSTANDING ACHIEVEMENT AWARD
TSgt Scott A. Roode
366 FW, Mt Home AFB ID

GROUND SAFETY OUTSTANDING ACHIEVEMENT AWARD
TSgt Jeffery A. Hall
325 FW, Tyndall AFB FL

GROUND SAFETY SPECIAL ACHIEVEMENT AWARD
Ms. Tamara E. Togiai-Paaga
9 RW, Beale AFB CA

FY17 Flight

As of 31 Dec 2016

	Fatal	Aircraft Destroyed	Class A Aircraft Damage
1 AF			
9 AF			
12 AF		(MQ-1)	
25 AF			
USAFWC			
ANG (ACC-gained)			
AFRC (ACC-gained)			

FY17 Occupational

As of 31 Dec 2016

	Fatal	Class A	Class B
AFCENT		0	1
12 AF		0	0
USAFWC		0	0
25 AF		0	1
9 AF	(*)	1	1

FY17 Weapons

As of 31 Dec 2016

	Class A	Class B
9 AF	0	0
12 AF	0	0
USAFWC	0	0

Legend

Class A - Fatality; Permanent Total Disability; Property Damage $2,000,000 or more
Class B - Permanent Partial Disability; Property Damage between $500,000 and $2,000,000
Class C - Lost Workday; Property Damage between $50,000 and $500,000
(Class Description Effective October 1, 2009)

* Fatality ** Non-rate Producing *** Performing SOUTHCOM Mission

(*) = Fatal (*) = Fatal due to misconduct

Flight Notes

Keep up the great work, ACC Aircrew! After a challenging FY16, ACC posted a quarter with no aviation flight mishaps. However, ACC still suffered the loss of two destroyed aircraft, a U-2S and an MQ-1. The U-2S was destroyed by a collision with a motor vehicle during towing operations in the AOR, the second loss of a U-2S in less than two months. The MQ-1 loss also occurred while supporting contingency operations. Fortunately, we did not lose any AF Airmen in these mishaps. Still, losing an aircraft even during ground operations reminds us that there is nothing we do that is simple, routine, and without hazards. Keep your focus, maintain professional discipline, and be on the lookout for unrecognized hazards. Fly safe!

Occupational Notes

An analysis of ACC's 1st quarter FY17 mishaps yielded mixed results in comparison to the same timeframe in FY16. The command suffered one fatal mishap (involving motocross racing) in the first quarter of FY17 as opposed to two fatalities in 2016; (one involved motorcycling and the other was a 4-wheeled vehicle accident). ACC had ZERO Class B mishaps during the 1st quarter of FY16, however, we've already suffered THREE this FY. The first one was when a member slipped mowing his lawn, causing his foot to contact the lawnmower blade. The second mishap was when a member received 3rd degree electrical burns from a 240V electrical wire. And lastly, ~$600K damage to an aircraft engine while in the test cell. Let's make sure we use existing regulations, wear proper personal protection equipment, and remain aware of environmental hazards that make everyday activities dangerous. Sound risk management concepts like Check 3 GPS, and being a good wingman every day and everywhere will go a long way in helping commanders, supervisors and individuals alike to achieve our ultimate goal of ZERO mishaps!

Weapons Notes

ACC experienced four reportable weapons mishaps during the first quarter of FY17. The one worth pointing out was Class D damage to a CATM 120 wiring harness cover during missile maintenance. A maintenance member physically stepped on the wiring harness cover causing unrepairable damage. Not surprisingly, complacency was causal. These types of mishaps might be small in the grand scheme of things, but let's continue to work on the small stuff to prevent the big mishap. Complacency endangers you and those around you.

Symbols for Mishap Aircraft


OVER the Edge
MAGAZINE
ROAD RASH
HURTS!
PAGE 15
V3

OVER the Edge MAGAZINE

OVER THE EDGE CONTENTS

Cover Photo by: Senior Airman Dennis Sloan

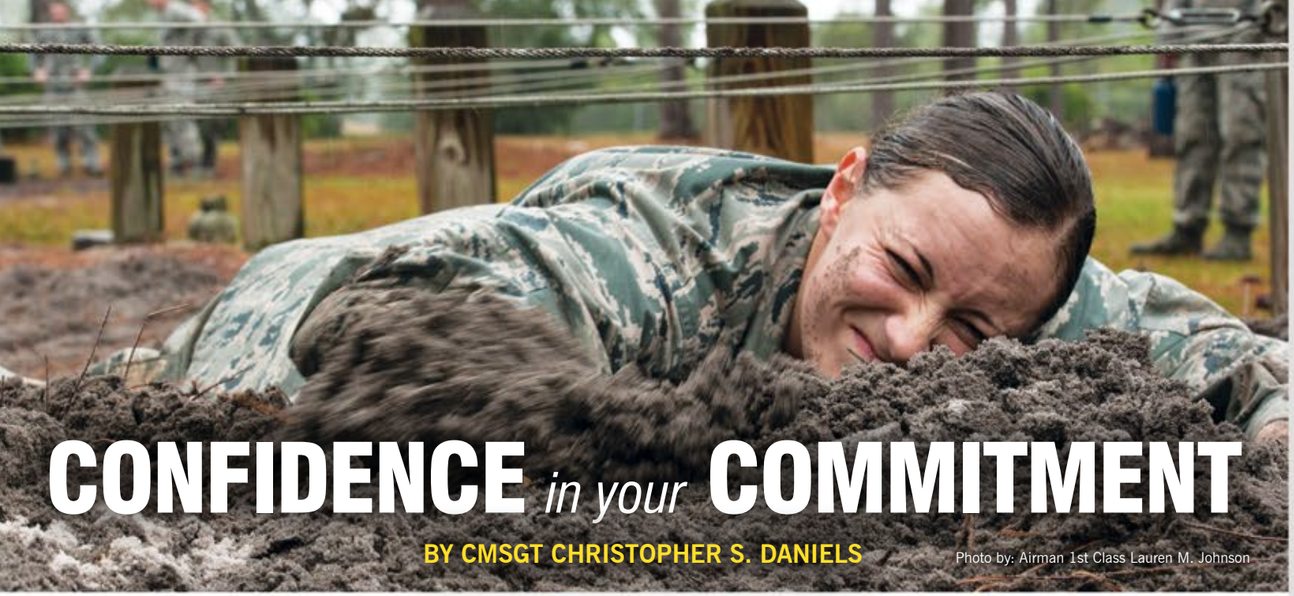
What is Check Three you ask?

Check 3 is a quick and easy method to assess any activity or event for possible hazards. The "Check 3" approach is assessing three areas referenced by the common acronym GPS. In this case, GPS is not referencing a navigation aid. Rather, GPS is: Gear - Plan - Skills.

This allows a quick review of your activity to highlight any issues or hazards. For instance, "G" (gear) may be your equipment, vehicle, or availability of drinking water. "P" (plan) may be the timeline, weather, sequence, and backup plans. "S" (skills) may be your rest level or overall experience level. If you see an issue or hazard in any of the areas, adjust an area to mitigate the hazard, especially the plan. Check 3 allows you to have a quick mental method to assess any activity.

check3gps.com

Photo by: Airman 1st Class Jenna K. Caldwell



CONFIDENCE *in your* COMMITMENT

BY CMSGT CHRISTOPHER S. DANIELS

Photo by: Airman 1st Class Lauren M. Johnson

As Chief, Occupational Safety, I've always been a student of the techniques of good decision making. While some suggest that good decision making is common sense, using that thought process, one could easily fall victim to this time-tested fallacy. Often, good decisions involve more than simply going with your gut. Instead, we should be deliberate in our thoughts and actions. There's an old adage in safety that comes to mind that asks, "What comes first, the mission or safety?" This seemingly simple question often leads to knee-jerk responses from many, yet we must guard against it. While the mission is paramount, we must infuse safety in our thoughts and actions every step of the way. If we are to continue as a world class airpower enterprise, we must find innovative ways to merge the mission with safety while taking care of our people, thereby preventing mishaps and preserving combat capability.

Our Airmen are the foundation of why we are as good as we are. We must cultivate a culture of balance, innovation, and leadership by understanding the needs of those around us as we forge ahead with changing mission requirements. According to Abraham H. Maslow, there are five needs that we all have as humans. 1. Physiological: air, food, water, sleep, other factors towards homeostasis, etc. 2. Safety: security of environment, employment, health, property, etc. 3. Belongingness: love, friendship, family, etc. 4. Esteem: confidence, self-esteem, achievement, respect, etc. The final needs include: self-actualization, which embraces morality, creativity, problem solving, etc. The sixth level was later added to include intrinsic values such as truth, goodness, service, etc. Each of these are vital to the development of our Airmen, and accomplishment of the mission. As the five components of the Air Force symbol represent our force and family (i.e. active duty, civilians, Guard, Reserve, and retirees), it should also represent our commitment to our mission and wingmen. To achieve our full potential, we must provide for today, prepare for the future, and solidify our foundation: Our Airmen.

Providing for Today

Leaders and subordinates alike must be mindful of our changing force, from shortages in resources, especially manning and funding for new mission sets; whether it be the application of remotely piloted aircraft or joint operations. The Air Force has long acknowledged that flexibility is the key to airpower, as such, we must adapt quickly to requirements whether it be the enlisted evaluation system, weighted Airman's promotion system, or the chain of command. Simply having confidence in our commitments will solidify our convictions, making us more effective members of this great organization. It is imperative that we remain committed to our leaders, the mission, and one another whether you are enlisted, officer or civilian. If we stay true to these dynamics, our ability to meet the needs of our nation become much easier. However, I would be remiss if I said this is always an easy thing to do. Sometimes life gets in the way of us being the best version of ourselves that we can be; therefore, we must be vigilant of threats that can hamper our success. For example, although members of the Air Force, ages 18-26 are at the greatest risk for mishaps, it's important to note that at any given time, we are all in the threat zone both on- and off-duty. As we provide for today, it's critical that we are committed to prepare for the future.

Preparing for the Future

Many years ago, when I was a young weapons loader struggling to adapt to the Air Force, a great leader once told me that preparation is not lost time. You see, the daily grind of loading practice munitions seemed monotonous to me and was time wasted, or so I thought. What I didn't see was the big picture. My supervisor soon explained to me the importance of our roles as weapons loaders and how being prepared supported the needs of our leaders and the nation. He taught me that we must prepare for the future with vigor if we are to keep pace with emerging requirements. We live in a technologically diverse world, which is filled with an abundance of safety hazards. In our business, we cannot be risk averse; we must do all we can to manage risks down to an acceptable level–doing this requires us to accept no unnecessary risk, make risk decisions at the proper level, and integrate risk management into operations, activities and planning at all levels.

Moreover, preparing for the future also includes being aware of the needs of our Airmen; without them, our mission simply won't get done. Each member of our great establishment has human needs that must be met if they are to maximize their effectiveness. It is our job as leaders to capitalize on the strengths of our Airmen while bringing their talents to bear onto the mission. According to the Comprehensive Airmen Fitness principles, when Airmen are mentally, physically, socially and spiritually fit they are more effective. Likewise, when members abide by these principles they are less likely to be involved in mishaps. Additionally, members with a healthy outlook on life are less likely to engage in self-harming activities and tend to be more productive. As Airmen, we must innovate as needed. It is vital that we trust tried and true techniques. As a service, innovation is a hallmark of the Air Force and understanding the needs of our Airmen will help drive improvements. A culture of Airmen taking care of Airmen, whether in uniform or not, solidifies the foundation on which we operate.

The Foundation: Airmen

As mentioned earlier, both the mission and safety must work together as a cohesive body for us to realize our true potential. As an organization, we cannot be risk averse. When we fail to reduce risks to an acceptable level, we increase the potential for mission failure. Ultimately, we are only as strong as our weakest link, and therefore it is important to equip our Airmen with risk management tools. Leadership and subordinate commitment alike can influence positive outcomes in the mission. Commitment to the Air Force's core values, taking care of one another, and integrating safety into all we do are things we can do to minimize risk and reduce injuries, illness, fatalities, and property damage.

Bottom-line, our mission is paramount but we must reduce hazards in so far as possible as we execute daily tasks. Remember, each Airmen is unique and we cannot use a cookie-cutter approach when dealing with people. We must remain vigilant of the physiological, safety, belongingness, esteem and self-actualization, and the intrinsic needs of individuals—much of this can be achieved via a strong Comprehensive Airmen Fitness regimen. As we provide for today's mission requirements, we must simultaneously posture our forces for future endeavors; promoting a culture of Airmen taking care of Airmen whether in uniform or not, solidifies the foundation on which we operate. These strategies come together as ways to prevent mishaps and preserve combat capability.

Grand Canyon Run

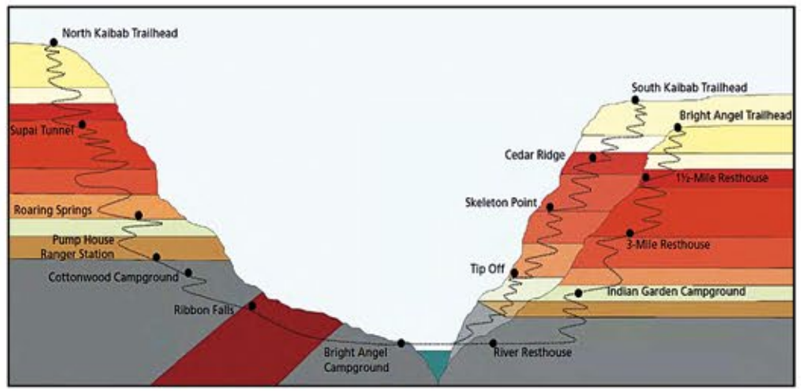
BY MASTER SGT. ERIC HASELBY

It's dark. The only light I see is being projected from my forehead, which robs you of your depth perception. It feels like I am on a never-ending stair stepper; just as I step over the log/rock, another appears. My mouth is uncomfortably dry, and I can feel the grit in my teeth from the hours of blowing dust. Three feet to my left, a sheer rock face; three feet to my right, an abyss of pure darkness; I'm moving slower than I could ever imagine, but I am continually gasping for air. My legs ache, my heart rate won't come down, and there seems to be no end to this climb. What went wrong? How did I get myself here? Suddenly the Grand Canyon wasn't feeling so "grand."

About six months earlier, a friend and I were talking about bucket list items, and Rim-To-Rim-To-Rim came up. Also known as R2R2R, or R3, this is the crossing of the Grand Canyon from one rim to the other, and back, in a single day. At the time, I didn't hesitate, and told him to count me in. Little did I know R2R2R covers almost 50 miles of trail, and over 20,000' of elevation change. As soon as I started doing research and planning logistics, I knew it was going to be an epic challenge! I am an avid marathon and ultra-marathon runner, so I felt comfortable with my fitness base, and did not incorporate any specific training (big mistake).

I am the Running Team Manager for the US Military Endurance Sports Team (www.USMES.org), so I invited some teammates to join my friend and me on our adventure. We worked for months planning the flights, rental car, and other logistics. Before we knew it, it was time to head to the canyon.

We started well before first light at the South Kaibab Trailhead (7,260', 4:42am). The team was moving great; not too fast, not too slow. The footing can be pretty tricky as you bound from log step to log step, avoiding loose rocks, while still trying to look up from time-to-time to watch the sun break over the North Rim. Even after only a few miles, I felt fatigue in my legs, and we had a LONG way to go.



How Far? Here are the numbers:

South Kaibab Trailhead to Bright Angel Campground
– 7 Miles / 4,780' descent

Bright Angel Campground to North Kaibab Trailhead
– 14 Miles / 5,761' climb

North Kaibab Trailhead to Bright Angel Campground
– 14 Miles / 5,761' descent

Bright Angel Campground to Bright Angel Trailhead
– 9.5 Miles / 4,380' climb

Total – 45ish miles

We continued our descent, doing our best to save our legs. It was finally bright enough to start taking video, snap photos, and enjoy the unbelievable scenery that no other place on earth can offer. We made two quick pit stops at Cedar Ridge (6,120') and Skeleton Point (5,200'), and before we knew it, we had reached the Colorado River (2,480', 6:30am).

We all celebrated a little as we crossed the steel bridge, each of us snapping photos, taking video, and joking about how we accomplished more before 6:30am than most people do in an entire day. Once across the river, we came across our first water stop. Everyone was sure to fill up since we had just over 7 miles, and 1,600' of climbing before our next pit stop.

We reached the Cottonwood Campground (4,080', 8:42am), and I realized I was carrying too much water. I opted to ditch the extra 1L of water and continue on with two 20oz bottles in my vest. I knew it was a gamble ... a risk I shouldn't have taken.

We stopped at the Pump House Residence (4,600', 9:30am), dropped our packs, and doused ourselves in the cool water. I had already burned about 2,000 calories, so I did my best to remind myself (and others) to continually eat and drink. We topped off, packed up, and moved on.

Just like the trail, we continued on. Up and up we went, with no end in sight. By this time, temps had reached into the mid 80's, and I couldn't wait to get to the top to feel that cool mountain air. We climbed, climbed, climbed ... then we climbed some more. Did I miss something? Did I take a wrong turn? Where the heck is Supai Tunnel?! The trail got steeper as we settled into the dreaded switchbacks.

As the pine trees began to appear, so did the tunnel. We had finally made it to Supai Tunnel (6,800', 11:30am), last stop to the top. As we sat in the shade, shoved food in our face, and refilled our bottles, we were pestered by deer flies as they continually fed on us like buzzards on a carcass. It was time to move on.

We finally reached the North Rim (8,241', 12:30pm). The high fives were abundant, but our celebration was short lived. The euphoria of reaching the top quickly wore off as we began to discuss the trip back down the mountain. After 15 minutes of rest, we began our journey back (12:45pm).

The miles were ticking away, and my legs were throbbing. I tried to enjoy some of the sounds of nature on the way up, but I opted to crank some tunes on the way down. I passed by Supai Tunnel (6,800', 1:30pm), Roaring Springs (5,220', 2:10pm), and made it to the Pump House Residence (4,600', 2:30pm).

I could tell the trail had already taken its toll on the group. At this point, there weren't many smiles. I personally came into this challenge with a goal of 15 hours. We had just passed the 10-hour mark, and there was lots of work left to do. I had never climbed Bright Angel Trail, so I had no clue how long it would take. So, I decided to change my goal from "completing the run in 15 hours," to "surviving the canyon."

We arrived back at Cottonwood Campground (4,080', 4pm), and boy was I happy to have some cool water! We were moving at a good pace, but we didn't seem to be making up any time. I was discouraged, and I was hot (temps in the 90's). I remember calculating how much water I drank during the same 7.2 miles earlier in the morning, and I "knew" 40oz would get me there safely.

Leading up to the run, I had fears of becoming a statistic. Whether it was from dying of heat stroke, or falling off the ledge, I didn't want to be "that guy." During this period of intense heat, I made sure to stay hydrated. According to my GPS, it was mile 5 of the 7.2-mile stretch that I began to worry about running out of water. I went into conservation mode, and changed from gulps to sips. Right as I sipped my last few drops, we came across some hikers. "How far until Phantom Ranch?" we asked. "3.6 miles" they replied. IMPOSSIBLE! I knew my GPS was right, and Phantom

Ranch should be just around the next corner! Ladies and gentlemen, do not trust your GPS within the canyon walls. About 3 miles later (just as the hikers suggested), we arrived at Phantom Ranch (2,480', 5:40pm).

After a quick stop to hydrate, eat, and regroup, we knew we had to keep moving. We trekked through Bright Angel Campground and came to the long, silver bridge that crosses the Colorado River (2,480', 6 pm). Another small victory, this was the gateway to the last leg of our journey.

We climbed past the River Rest House, which I quickly realized had no drinking water source. I had made the decision to save weight and only fill two 20oz bottles at Phantom Ranch, which was obviously not enough to get me to Indian Gardens ... two hydration mistakes in the same day. As I ran dry with miles to the next stop, some hikers graciously offered up 10oz of their precious water. Thirsty and tired, I eventually made it to a water source at Indian Gardens (3,800', 8:00pm).

The scenery changed from breathtaking landscapes to a dimly lit 10-foot circle directly in front of me. A dozen or so painful switchbacks later, we hit the 3 Mile Rest House (4,748', unknown time, my watch died). The good news—we had three miles left. The bad news—we had three miles left. I cranked up the volume on my iPod from time-to-time to get a little boost of energy, but I was running on reserves, and my reserves were almost empty. What went wrong? Was it the heat? Was it the altitude? Did I underestimate the canyon?

We came across the 1.5 Mile Rest House (5,729', unknown time), and I was too tired to celebrate. I filled my bottle and continued. This brings us to where my story first began. Exhausted, dehydrated, and in pain, I concentrated on putting one foot in front of the other. I probably should have taken out my camera and documented the final steps, or said something inspirational to mark the completion of this epic journey, but I was too tired. I do remember using a few choice words that are frowned upon in most public areas, but I was speaking from the heart. I was done (6,860', 10:30pm)!

Everyone on the team completed the challenge and made it out of the canyon safely. However, even with what I thought was the right Gear, Plan, and Skills there were too many close calls. The acceptance of risk is not a substitute for adequate equipment, proper planning, and the appropriate expertise. Once you feel you have "Checked 3," be sure to check it again.

If you are interested in reading more about my R2R2R adventure check out the full story and movie at www.runridelife.com.

it works off duty.
it works on duty.

... it works well for ALL you do!

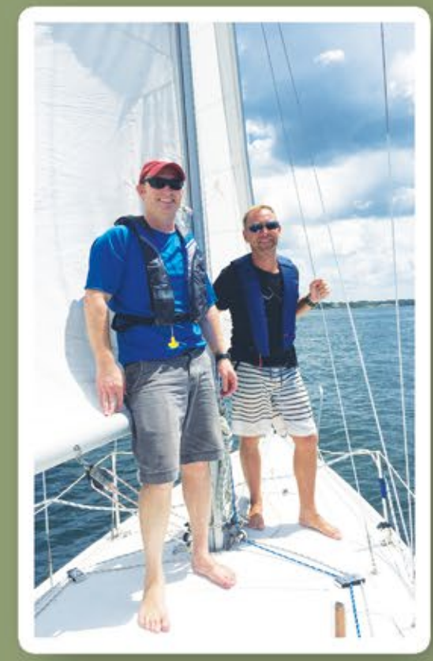
Photo by: Staff Sgt. Christopher S. Muncy

CHAMPIONS

Know of a Check Three Champion you'd like to highlight? *Send us a photo and synopsis of their activity and how they Check 3 GPS in their day-to-day activities. ~Ed.*

Lt Col RAMSTY Siberski and Maj Nerf Douglas
53d Wing, Eglin AFB, FL

It's early Wednesday evening, the sun is shining, and the wind is steady from the south. Lucky for us amateur sailors, it's race day. Every Wednesday is the same task: safely, efficiently, and effectively navigate my Catalina 25 sailboat around a race course in the Choctawhatchee Bay. We prepare to max perform the boat and ourselves—often within feet of other boats—the same way every week. We check all the gear: radio, life jackets, water, lines (ropes), fuel, the shrouds that hold up the mast, etc. Once we receive the race course, we go over the plan: Do we need to lessen sail area or change sails? Do we need the spinnaker? Where are we going to start on the line? What tack are we going to use? And we'll finish with a recap of emergency procedures in case someone inadvertently goes swimming. Finally, we assess our skills. RAMSTY has been sailing since childhood and I've been doing it for a few years. Still, we ensure our skills are at the right level for the conditions (weather, people on board, other boats, etc.). If not, we'll power up the motor and pack up for the night. Whenever we get ready to set sail, we always Check 3!



Maj 'Rex' Kitchen
Nellis AFB NV

As Major Kitchen rides past Mirror Lake in Northeastern New York on the start of a 112-mile trek, he is mentally running through his pre-ride checklist of the various components of his Fuji D6 tri-bike. Triathlete "Rex" Kitchen is in the middle of yet another grueling physical test, this time an Ironman Triathlon at Lake Placid, New York. Maj Kitchen, a member of the 64th Aggressor Squadron, ACC's only Air-to-Air OPFOR squadron, also flies F-16C jets to provide high-end threat replication of adversary platforms while training US and coalition warfighters in aerial combat. 'Rex' knows that whether he is "pulling G's" in his F-16C or on the last leg of his 26.2-mile run, the importance of wearing the proper gear, planning for safe and effective operations and operating within your skill set is paramount! Always remember to Check 3 GPS!

Digitally DISTRACTED

BY STAFF SGT. RHEBB A. HULETT

Let's face it! In 2016, people weren't the best at paying attention. With the proliferation and popularity of cell phones and social media, it's all out digital saturation. Neither of these things are inherently dangerous in and of themselves. But put all that technology in a handheld device, with someone content to look at it, and there is potential for catastrophe. Situational awareness is a fading skill in many folks, and it's painfully apparent everywhere you go: the mall, busy sidewalks, or the airport. All of these locations are filled with people fixated on their phones, mindlessly trudging along with almost no regard for their surroundings. It's a problem, to say the least.

We all know, or at least we should know, the dangers of texting and driving. But today, the risk of getting hurt or hurting someone while using an electronic device extends beyond the roadways. According to Alan S. Hilibrand of the American Academy of Orthopaedic surgeons, various data suggests that at any given moment on the streets of America, 60 percent of pedestrians are distracted while walking; meaning either talking on the phone or doing something on their phone. Vehicle collisions with pedestrians who were looking at their phone are an all-too-common occurrence, and a quick Google search can bring you link after link of articles and videos of people walking into stationary objects or falling off curbs, stairs, and other elevated platforms. A San Diego man fell over a cliff to his death while distracted by his electronic device. Witnesses said he walked right over the edge as he was looking down at his phone. If that man would have had an ounce of situational awareness, he may likely have been alive today. Tragedies like this are almost 100 percent preventable.

Injuries and deaths due to traffic collisions or falling down the stairs are not the sole danger of cell phone distraction. Situational awareness keeps you safe from more than just environmental hazards, because in today's fast-paced world, a normal situation can turn deadly at the blink of an eye.

All in all, the average American needs to spend less time distracted by their digital world. The technology we have at our fingertips is truly amazing and most definitely an integral part of most of our lives. The moment we put ourselves or other people in danger to chase after a fictitious digital creature via handheld augmented reality, we need to take a step back, wake up, and open our eyes to the world around us ... there just might be a car coming!

RIDER'S RAP

ROAD RASH HURTS!

BY TECH. SGT. ANDREW CASKEY

It was a normal September Saturday in Florida, skies were bright and the heat and humidity was finally bearable. My buddy and I were out for a casual ride. Nothing to it, most roads in this part of Florida are pretty straight so as far as experience level anyone would be good. We rode for an hour or so before we decided to head back to base. Nothing could have better prepared me for what happened next.

As we rounded the corner of an intersection to get on a main road I gave a little throttle, when the back end of my bike just slid out from under me. I tried to gain control, but in doing so I accelerated forward. As I laid it down on the left hand side, my foot peg stuck and sent the bike into an end over end roll and me "flying" over and in front of it. I was wearing all the Personal Protective Equipment (PPE) that the Air Force and Motorcycle Riders course instructed me to. But did I come away uninjured and free of harm; NO!

Here's the thing. I was told to wear long pants, long sleeved shirts, over the ankle boots, helmet, and gloves and so on. Should I or would I now wear anything differently for that particular day of riding ... no. But here is what I learned. Long sleeve shirts roll up when faced with asphalt. So do loose blue jeans. The whole side of my body was raw from road rash. My jeans covered me from the waist to the knee but my calf was pretty much exposed upon impact. My left sleeve came right up exposing my forearm and the back didn't protect my skin much better.

I received the next week of work off with some pretty heavy pain killers and a lot of agony in the shower and on the couch. Road rash hurts like a bad sunburn that somebody keeps slapping. So why am I writing this? For those of you that have not upgraded your PPE other than long sleeves and long pants, I would highly encourage you to do so. I was at a max speed of about 30 mph and slid for about 50-60 feet. I did end up breaking my wrist but that was because I put my hand down to stop sliding. Implement some leathers; they are designed to fit snug to your body, not ride up—and let the leather do the wearing rather than your squishy outer skin.

HOW CAN CHECK 3 HELP?

Regardless of your experience and knowledge, always be sure to Check 3 ... that's your Gear, Plan and Skills before any activity.

Gear: Is it in good working order?

- Check your brakes and tires before riding.
- Be sure to ride with a helmet, gloves and any other proper PPE suitable for the trip.
- Consider high visibility attire.
- Check the overall condition of your motorcycle—headlights, oil, etc.

Plan: Plan your ride.

- Be prepared for the weather.
- Know the terrain you will be riding.
- Have a defensive plan of action.
- Always consider the two Ds ... Duration and Distance.
- Have a way to communicate with other riders.
- Never drink and ride.

Skills: Are you up to the activity?

- Complete all necessary training.
- Understand/know the risks associated and be prepared to mitigate them.
- Never ride in a car's blind spot.
- Make sure you're well rested.