

Volume 4, Number 3

Summer 2011

WINGMAN

Airmen Taking Care Of Airmen

The United States Air Force Journal of Aviation, Ground, Space and Weapons Safety

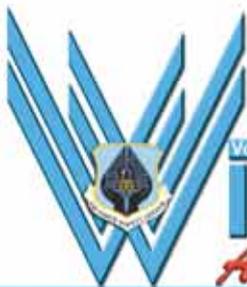


Safe Landings

The Choice is Yours

A Mural Says it All

Saving Earth Orbit, One Piece of Junk at a Time



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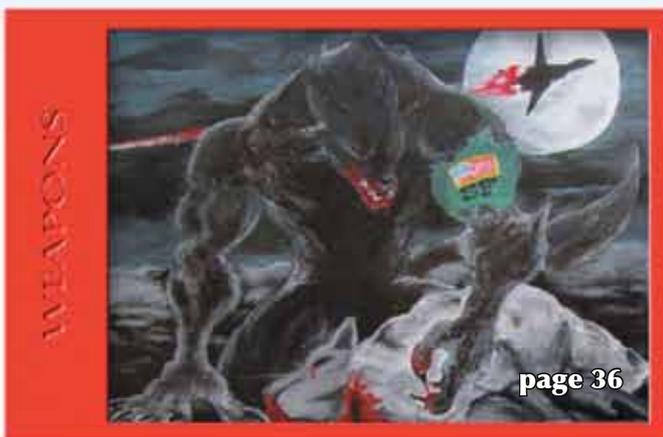


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Every Airman is a Communicator



U.S. Air Force photo by Dennis Spotts

MAJ. GEN. GREG FEEST

Air Force Chief of Safety and
Commander, Air Force Safety Center
Kirtland AFB, N.M.

Our mission at the Air Force Safety Center is simple – prevent mishaps and preserve combat capabilities. Our organization strives to give the very best safety education, training and support toward these goals, but imagine how much more we could do if every active-duty Airman, reservist, guardsman and civilian in our Air Force got involved. Every Airman can play a role in preventing future mishaps and telling the Air Force safety story. I believe every Airman is a communicator.

For example, in order to improve our communication with Airmen 17-26 years old, for the second year in a row, we formed the Airman-to-Airman (A2A) Safety Advisory Council. Ten members, ranging from airman to second lieutenant, visited the Safety Center in February and suggested ways for our Air Force to improve our outreach to this high-risk age group. Nominated by their MAJCOMs, these fine representatives will communicate lessons learned from their own experiences. At the same time, they give us an understanding of how young Airmen think, what resonates with them and how they choose to communicate safety messages to their peers. We feel confident their experiences, ideas and stories will have an impact on a larger, Air Force audience.

In this issue, you'll find an article from a senior airman at Andrews AFB, Md., who wrote about a speech she gave to her squadron detailing what she thinks it means to be a good Wingman. You'll find stories from students

of two of the many safety education courses offered at the Air Force Safety Center — the Aircraft Mishap Investigation Course and Aviation Safety Program Management Course. Our goal is for these students to share their safety experiences to help prevent mishaps. Their articles discuss some important summer issues such as teamwork during deployments, heat stress, pilot fatigue and caring for sick passengers.

With the Critical Days of Summer upon us, the ground safety articles remind us to pay attention to the dangers of operating automobiles, motorcycles and personal watercraft. In another article, an A2A Safety Council representative provides a gripping, first-hand account of riding in a car driven by a drunk driver and the lessons she learned from this harrowing experience.

Our weapons articles talk about the importance of getting the right training for your tasks and the enhanced dangers of lasers when combined with viewing equipment. Also, we've included a story about members of a deployed unit that left their own "legacy gift" through a mural painted on a blast mitigation barrier and how it honors the men and women who are sacrificing so much for our nation with the hope they return safely home.

Finally, our space stories focus on issues posed by orbital debris and the various Department of Defense and Air Force instructions that relate to effectively implementing orbital safety policy.

As you enjoy the summer months, I encourage you to share your safety experiences and lessons learned at your bases and units and reach out to people in need of their Wingman. We can't do it alone. Help us tell and live the Air Force safety story! ★★



Airman-to-Airman Safety Advisory Council

Making the Message More Personal

STAFF SGT. CRYSTAL N. WILSON
509th Bomb Wing
Whiteman AFB, Mo.

U.S. Air Force photo by Dennis Spotts
Photo Illustration by Dan Harman

I have the honor of being one of ten Airmen to serve on the 2011 Airman-to-Airman Safety Council. Coming in from bases around the Air Force, we held our first meeting at the Air Force Safety Center at Kirtland AFB, N.M., Feb. 8-10. Prior to our arrival, none of us could've possibly imagined the impact this task would have on our lives or the lives we hope to touch.

On the evening of our arrival, we met up for dinner to get acquainted and introduce ourselves. We already knew we had something in common having been chosen by our respective MAJCOM because we had been involved in a safety-related incident. That night, as we each shared our story, you could feel how the stories touched each of us. You couldn't help but sense the feelings of regret, sorrow, remorse, disbelief and guilt that haunted each and every one of us.

During the first day, we were briefed by the Air Force Chief of Safety, Maj. Gen. Gregory Feest, and the Deputy Chief of Safety, Mr. Roberto Guerrero. As they told us about the AFSC mission, we realized even more the reason we were there. We had the job of helping the Air Force come up with ways for the safety message to better reach our peers in the 17-26-year-old age group. It not only was our task, it was our duty to portray, by our examples, what the severity of a situation can become if safety precautions aren't followed.

During the remainder of the week, we were involved in many discussions. One of the main topics was how to best communicate the safety message to our peers. Messages to the 17-26 year age group should be personal and interactive so they hit closer to home. Many of us would rather receive a text sent from a supervisor or peer than a generic e-mail from someone we don't know. We also talked about guest speakers at commander's calls, discussion group forums and

the possibility of interactive crash labs. Reaching our audience is going to take a variety of communication methods for getting the word out.

Through the tours and discussions during the week, we were able to see how safety is a part of everyone's life. From ground, to space, weapons and aviation safety, everyone needs to be involved and knowledgeable. We discussed texting and driving and how in one quick second, your life could change. Also, we addressed road conditions, fatigue, distractions, as well as drinking and driving. Throughout every discussion, one thought never left our minds: it's our duty to come up with ideas for reaching out and getting people to listen to the safety message before it's too late.

We're all excited about what this year will bring for us and the impact we hope to make on the Air Force. Some of us chose to make a video to reach out and share our stories so that others may relate to us. Other members of our group created a basketball safety message that will be aired at Army and Air Force exchanges and commissaries all over the world. There are so many different programs that we're getting involved with and so many ideas we hope to share. There was frustration at times in many of our meetings due to the diversity of the Air Force; trying to find ways to get people to listen to our message seemed impossible. By the time the week ended, we had reached one goal: if we can touch just one person's life and get just one person to listen, we've made a difference and possibly saved a life.

Thank you to the AFSC team for giving us the opportunity to be part of the 2011 A2A Advisory Council. We look forward to working with Airmen across the Air Force this year to get the message out that AIR FORCE SAFETY IS NO ACCIDENT! 🚀

What does it mean to be a good wingman?



SENIOR AIRMAN KAILIE M. DOUGHERTY
89th Communications Squadron
Joint Base Andrews, Md.

Available. Dedicated. Concerned. Dependable.
Supportive. Loyal. Committed. WINGMAN!

In December of 2010, I was one of three Airmen tasked by my commander, Lt. Col. Bryan Richardson, 89th Communications Squadron commander, to brief my 200-member squadron on the importance of what I thought being a good wingman meant. Imagine my reaction when I found out my commander had challenged me with a task so large. It made me feel important as an Airman to have that responsibility. It even brought value to me as a wingman, to know that my leadership wanted to hear my opinion.

I began to think. I thought about my life before and during my Air Force career. I thought of my family, who thankfully was always there for me. I thought of my friends, peers and leaders, but there was one day I just couldn't get out of my head.

During the fall of 2008, I had the quietest day of my Air Force career. I remember it like it was yesterday. That day nobody spoke; we had our mission to focus on. We began with the morning brief, sat at our consoles and started our morning radio checks. It was painful to see all the held back tears in my fellow Airmen's eyes. It was only hours prior that one of our wingmen had lost his life to a motorcycle accident. We all knew he was never coming back. I felt sad and out of place. I was practically the newest Airman to the squadron. I didn't know what to say or how to react. So I said nothing.

After going over that painful memory over and over again, I wanted to go back and tell them all that they can lean on me. I wanted to help them through the terrible ordeal that occurred. To this day I wish my actions would have reflected what I think a wingman truly is. The following is what I said to my squadron ...

"Each and every person is a wingman. Whether in your past or present, you have opened yourself up to someone in a time of need. You have made someone laugh or helped someone in pain. For some, a wingman can be your spouse or child or your parent. For others, your wingman can be your fellow Airmen, your neighbor or even the pizza guy that delivers to your dorm every night. We are all wingmen.

"You don't have to be physically strong or even

highly educated to be a wingman. You don't have to go to a special class or sit through another 20-session computer-based training on how to be a wingman. You just have to be you.

"Some may not be that wingman for a particular person when another is, and that's okay. Everyone is different, everyone has different needs. The main thing you have to know about being a wingman is that you don't always have to be the hero. Sometimes you have to sit and just listen. Try to be the best you can be and, at the end of the day, don't forget to give yourself a pat on the back.

"A key aspect of being a wingman is to help yourself before helping others. This might seem selfish, but if you don't help yourself first, you will not be able to help your fellow wingman to the best of your ability. Don't be afraid to ask for help. Everyone needs a shoulder to lean on at one point in his or her life. You don't always have to be the wingman every time. Be strong and open-minded, and you will come to realize that everyone needs a wingman.

"Whether you are in a bad relationship or maybe someone close has passed on, you may need a helping hand. During hard times, many people feel it is their duty to act strong and keep their bearing, when in all honesty, they may not feel that way. But that doesn't mean you shut everyone out. As wingmen, we are like family. We naturally seek fellow camaraderie between our Airmen. We want that emotional acceptance to help raise our spirits.

"You develop a certain bond between the men and women you meet throughout your life. These bonds are almost like adopting a new brother or sister, or even a parent. Someone you know will always care about you. Someone who might have seen you at your very worst, but is still there to pull you up by your boot straps or lend a shoulder to get you through any troubles ... someone like a fellow wingman.

"In conclusion, I was given the task on what I think a wingman is. Looking back, I realize that each and every person has a different definition of a wingman. In my eyes, the word wingman shouldn't be so much defined, as it should be honored. I don't believe it should be a duty to be a wingman, but a moral responsibility in the hearts of every man and woman reading this today. It should be one of the many traditions that the Air Force holds — not only to our country but to ourselves." Thank you. 🇺🇸

Originally appeared on www.andrews.af.mil, Feb. 16, 2011.



"See 130 ... Degrees"

CAPT. ROB HAIRSTON
374th Airlift Wing
Yokota AB, Japan

U.S. Air Force photo by Tech. Sgt. Paul J. Page
Photo Illustration by Dan Harman

A typical summer day of flying in Southwest Asia for me started with checking out essential gear. The short time we spent in air-conditioned briefing rooms for pre-mission planning was a welcome respite from the high temperatures outside. We arrived at the aircraft hoping the crew chiefs had installed the reflective sunshades in the flight-deck windows. We kept them in as long as possible, but they had to come out sooner or later if we were going to see where we were going. If it was 110 degrees on the parking apron, it felt like 120 or 130 on the flight deck, the hottest part of the plane when the engines weren't running. The aircraft had been sitting in the sun for hours. Switches and instruments were hot enough to sting when I forgot to put my gloves on before touching them.

After preflight, the co-pilot, navigator and I went to the cargo compartment to help the loadmasters secure troops and cargo. We delayed going back to the hot flight deck as long as possible. We waited until just before the loadmasters were ready for engine start, then strapped in. Even with gloves on, holding the hot-metal starter buttons in long enough to get the engines started was just uncomfortable enough to notice. We accomplished checklists as quickly and efficiently as possible in order to get air conditioning operable for ourselves and the heavily-equipped combat troops sweating in the cargo compartment, packed in hip to hip. On a hot day, the air conditioning made just enough difference to keep people from passing out, but we couldn't get the temperature down to a comfortable level while on the ground.

After takeoff, on a flight long enough to make it to the colder air at altitude, the air conditioning finally brought the temperature down. Our flight engineer had to be careful not to let the aircraft get too cold since everyone onboard was soaking wet from sweat. Once we reached our destination and started our descent, at some point our flight engineer turned off the air conditioning and opened the aircraft to the rush of outside air. It was like rolling down our car windows at high speed, making it loud on the flight deck but keeping the temperature bearable.

We landed uneventfully, careful not to heat up the brakes we would need for the long taxi to parking. Our C-130 model was equipped with an older less-capable, less-automated version of the engine-oil system that required heavy coordination between the pilot and flight engineer to keep the engines from overheating on the ground. Thus, the flight engineer and I worked through our four-handed combination of steering,

throttle movements, up-speeding and down-speeding individual engines and frugal brake applications. Together, we maintained a safe taxi speed and a careful balance between overheating our engines and starting a brake fire on a hot day. Once back on the ground, the temperature onboard increased steadily. I decided we had reached the point that the outside desert air was cooler. I reached over with my free hand to open my window and let some fresh air into our sauna. The loadmaster in the cargo compartment had come to the same conclusion and opened the cargo door, letting in some fresh air and making the temperature a little more bearable at the cost of allowing in more engine exhaust.

We pulled into parking for our engine-running offload. Our loadmasters and the airfield's ground crew got to work downloading our cargo and passengers. The engine exhaust in the loading area made breathing difficult, and, if someone had stood in the wrong spot for too long, the heat was hot enough to have melted his or her plastic goggles. On the flight deck, I could tell how hot everyone was by the fact that they weren't talking about it. The heat was so obvious that to waste a breath mentioning it would be akin to saying, "The sky is blue." That or it was so obvious that complaining about it would just aggravate everyone else. Within minutes, everyone was pouring rivers of sweat, and anyone who had gotten even remotely dry on the two-hour flight was soaking wet again. The navigator moved into the cargo compartment to act as the safety observer, and I tried to refrain from asking him every five minutes how far along we were in loading. I also tried to avoid bugging the flight engineer about the air conditioning. I knew he was just as hot as I was. He might have been directing air into the cargo compartment to help the people working back there or he might have been trying not to overload our auxiliary power unit and start a fire. He was also still busy up-speeding, down-speeding and jockeying throttles to keep our engines from overheating.

There was very little conversation for the remainder of the loading. The only questions asked were mission essential and responses were polite but short as people tried to endure and conserve energy. It was only the first stop of many with a long day ahead of us. As the day went on, we started finishing water bottles with greater and greater frequency, and every time someone went back to the cooler for a new one, he would grab one for everyone else. If individuals had only looked out for themselves, I am certain someone would've passed out from dehydration, and we wouldn't have been able to finish our missions.. 

Safe Landings

SENIOR MASTER SGT. QUINTUS WOODS

36th Maintenance Squadron

Andersen AFB, Guam

AVIATION



U.S. Air Force photo by Dennis Spotts
Photo Illustration by Dan Harman

I was the production superintendent in the 71st Aircraft Maintenance Unit responsible for five CV-22B Osprey tilt-rotor aircraft. I had been in this position for about 1.5 years and had more than nine years of experience in the aircraft. In all my years working with the Osprey, I had never experienced what we were in store for that night. I was working the swing shift and during the turnover to the mid-shift production superintendent, we got the call, "Osprey 4 MOC aircraft is 20 minutes out with an unsafe nose-landing-gear condition."

Immediately, we both jumped into action. The mid-shift super started running the emergency-action checklist, while I went into the hangar and quickly assigned specific tasks to the maintainers. Luckily, we had extra people due to both swing and mid-shifts at work. After all the tasks were assigned, I ran over to the 71st Special Operations Squadron's operations desk. There we made contact with the aircraft commander. We discussed our plan of action using the emergency-action checklist as a guide.

The plan was to have the aircraft hover at the hover pad, while two crew chiefs verified the nose-landing gear was down and locked. Once the aircraft arrived, the two crew chiefs tried their best to get under the aircraft that was hovering just overhead. They tried two attempts, and on the second try, one of the crew chiefs injured his left wrist when the wind sent him cartwheeling about 15 feet down the flightline. After that happened, we realized how dangerous it was going to be to inspect the landing gear. I made the call to pull the crew chiefs to prepare for a mattress landing.

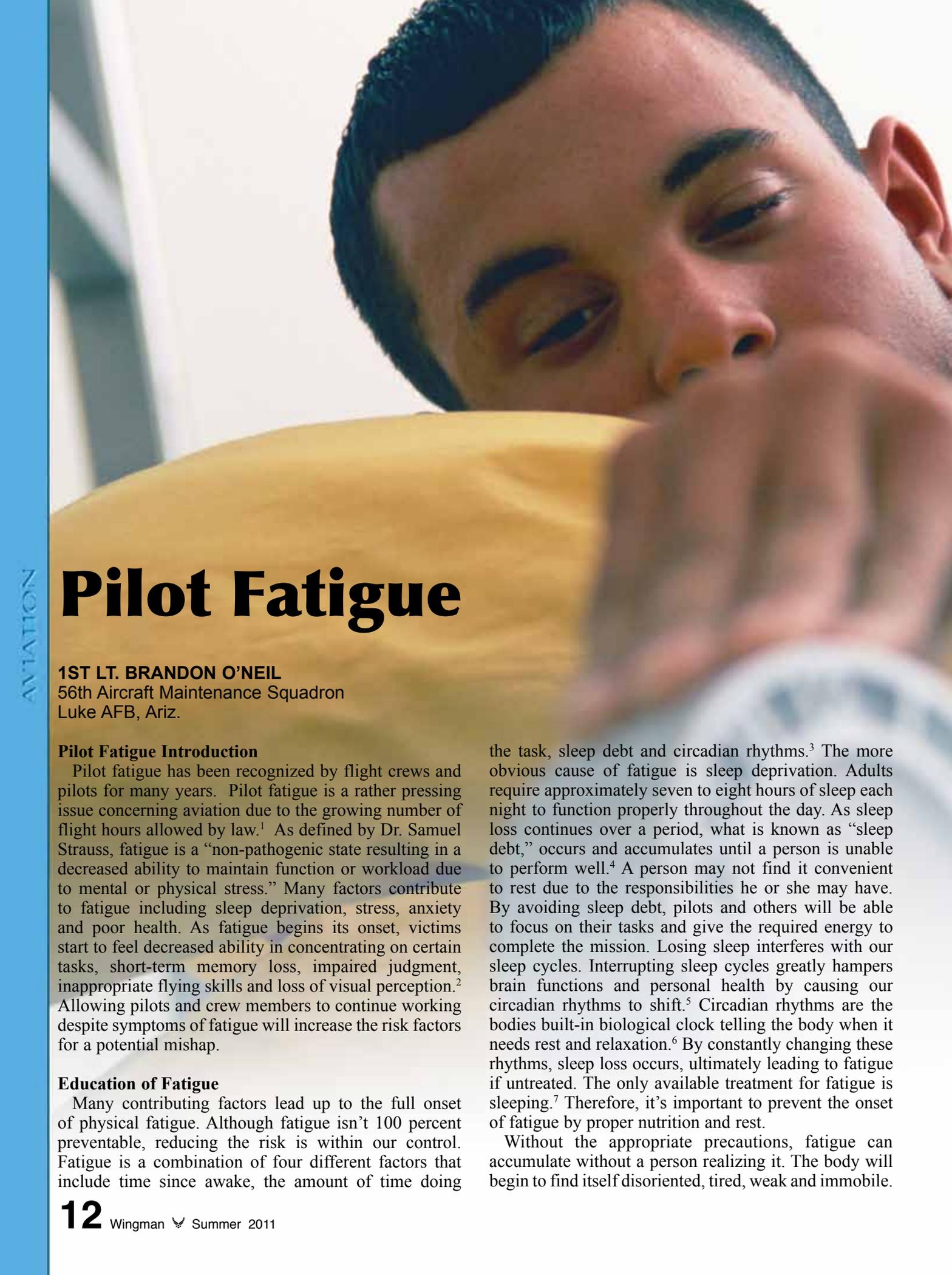
I assigned a crew to set up the mattress-landing area. This involved strapping down two stacks of regular twin-sized mattresses using tie downs to the designated landing spot. They grabbed our pre-staged mattress-landing trailer and set up the spot in slightly more than seven minutes.

Again, I went to the operations desk and contacted the aircraft commander, and we went over the plan for landing this 36,000-pound aircraft on some mattresses. The crew chiefs were in place, and I jumped into the truck and went out to ensure everything was set for the landing. The aircraft hovered over to the spot. The crew chiefs battled the rotor wash, while they marshaled the aircraft down and landed it safely on the ground. It was a huge relief to see the aircraft resting safely on the mattresses. We accomplished the first mattress landing in the history of the Osprey. I was very proud of the outstanding performance of the 71 AMU maintainers.

This was an amazing task that, outside of a minor wrist injury, was performed flawlessly. This is the day we had been training for, but until you have to actually perform the task, you can only guess how things will go. The men and women of the 71 AMU were ready. Without training, things could've gone very badly. Our efforts helped save the lives of the six aircrew members that were on the aircraft that night.

From our experience, we were able to identify some areas for improvement. From a safety standpoint, for all future mattress landings, no one was allowed under a hovering Osprey to verify the landing gear. The maintenance crew would go directly to the mattress landing spot. Also, we received some concerns from the aircrew. The crew chiefs were too close when they were bringing the aircraft in. The last thing we did was add a reference line for the aircraft commander to identify and use to help land the aircraft.

Overall, this was a safe and successful landing. All six subsequent Osprey mattress landings the 71st encountered were successfully performed and can be directly attributed to safety-conscious maintainers and their continued pursuit of excellence. ✈️



Pilot Fatigue

1ST LT. BRANDON O'NEIL

56th Aircraft Maintenance Squadron
Luke AFB, Ariz.

Pilot Fatigue Introduction

Pilot fatigue has been recognized by flight crews and pilots for many years. Pilot fatigue is a rather pressing issue concerning aviation due to the growing number of flight hours allowed by law.¹ As defined by Dr. Samuel Strauss, fatigue is a “non-pathogenic state resulting in a decreased ability to maintain function or workload due to mental or physical stress.” Many factors contribute to fatigue including sleep deprivation, stress, anxiety and poor health. As fatigue begins its onset, victims start to feel decreased ability in concentrating on certain tasks, short-term memory loss, impaired judgment, inappropriate flying skills and loss of visual perception.² Allowing pilots and crew members to continue working despite symptoms of fatigue will increase the risk factors for a potential mishap.

Education of Fatigue

Many contributing factors lead up to the full onset of physical fatigue. Although fatigue isn't 100 percent preventable, reducing the risk is within our control. Fatigue is a combination of four different factors that include time since awake, the amount of time doing

the task, sleep debt and circadian rhythms.³ The more obvious cause of fatigue is sleep deprivation. Adults require approximately seven to eight hours of sleep each night to function properly throughout the day. As sleep loss continues over a period, what is known as “sleep debt,” occurs and accumulates until a person is unable to perform well.⁴ A person may not find it convenient to rest due to the responsibilities he or she may have. By avoiding sleep debt, pilots and others will be able to focus on their tasks and give the required energy to complete the mission. Losing sleep interferes with our sleep cycles. Interrupting sleep cycles greatly hampers brain functions and personal health by causing our circadian rhythms to shift.⁵ Circadian rhythms are the bodies built-in biological clock telling the body when it needs rest and relaxation.⁶ By constantly changing these rhythms, sleep loss occurs, ultimately leading to fatigue if untreated. The only available treatment for fatigue is sleeping.⁷ Therefore, it's important to prevent the onset of fatigue by proper nutrition and rest.

Without the appropriate precautions, fatigue can accumulate without a person realizing it. The body will begin to find itself disoriented, tired, weak and immobile.



Liquid Library Image
Photo Illustration by Dan Harman

Symptoms of fatigue also affect health and mood. Specifically, scientists and psychologists have proven that loss of sleep can be detrimental both physically and mentally. Sleep deprivation causes vital energy stores in the brain to diminish.⁸ As the energy stores deplete, an individual may begin to feel irritable and unstable. The body's capacity to fulfill tasks and concentrate is greatly reduced, and cognitive performance is significantly weakened.⁹ Quite frequently, sleep deprivation causes hallucinations.¹⁰ Sleep withdrawal doesn't only affect the mental state, but it also affects physical bodies. Over time, the immune system is weakened and we become susceptible to many bacterial and viral diseases.¹¹

Solutions and Precautions

Although a solution to fatigue is adequate sleep, many preventive measures can be taken to reduce one's vulnerability. Sleep is a critical part of preventing pilot fatigue. No matter what may be causing fatigue, sleep is a reaction of the body telling it to relax and allow the body to rejuvenate. As life becomes chaotic and demanding, sleep and rest become more and more essential. The daily duties of so many Americans seems

to take precedence over rest and relaxation; however, it's important to balance work, school, family and other responsibilities so that our bodies are equipped with the required energy we need to accomplish our daily tasks. This is especially true for pilots. Fatigue is not only a pilot's worst enemy; it's also a safety hazard. ☞

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Tuzla
Slugger

Mitigating Risk to Save a Life

LT. COL. JAMES MCMILLAN

Defense Contract Management Agency
Marietta, Ga.

During my first assignment as a line crewmember, I learned a very valuable lesson about Operational Risk Management and Crew Resource Management principles. This anecdote shows how crews can mitigate risks using good ORM and CRM to accomplish their missions. While these principles cannot cover all situations, following them can keep crews safe.

It was a dark and gloomy night in the early spring of 1997. I was assigned as a line navigator in the 37th Airlift Squadron, Ramstein AB, Germany, flying C-130Es. The situation in Bosnia and Herzegovina had calmed down some, but the U.S. still had a large contingency of troops in country. My squadron had a standing-alert requirement, and it was my turn to sit the 48-hour shift. I spent my shift hanging out at home catching up on "honey-do's" and reading with the occasional nap. Around midnight, six hours before my alert ended, I forced myself to hit the hay even though I was not really tired. I had one too many naps I guess. Finally, I drifted into a restless sleep about 1 a.m., expecting to wake up at a normal time and be off to work later that morning.

About 4:30 a.m., I got the alert call, just 1.5 hours before our shift was over. Dragging myself out of bed, I did my normal routine and headed to the squadron. I downed some breakfast before I left and drank some caffeine on my way in to wake myself up.

I arrived at the squadron slightly more awake than

when I left home. As the other crewmembers arrived, you could tell everyone was dragging a little. We started the preflight process of checking weather, getting the tactics and intelligence briefs, etc. During the intelligence brief, we met up with the other part of our crew, the medevac team.

During our crew briefing, the medical crew director told us about the young man we were picking up from Tuzla, Bosnia-Herzegovina. He had been injured earlier in the day while playing softball. His buddy was batting and, after hitting the ball, he tossed the bat towards the dugout a little too hard. The injured man had his back to the action and was hit at the base of his skull. His brain was swelling, his retinas were detached, and he had been unconscious for several hours. The treatment administered at Tuzla was not working, and his condition required medevacing him to Landstuhl Regional Medical Center, Germany, for emergency treatment.

This is the kind of mission that airlift crews live for – the chance to make a real difference in someone's life. The aircraft commander had astutely observed the crew and noticed everyone was slightly dragging. He used the crew brief to address his concern. He started by asking how much rest everyone had gotten and if everyone was ready to go. We were highly motivated, but fatigue was a very real issue on this mission. Most of the crew had gotten about the same amount of sleep, 3.5 to four hours.



Liquid Library Image
Photo Illustration by Dan Harman

We discussed the situation and devised a plan to mitigate the risk. Obviously, this was a life-or-death mission, and factors beyond our control were increasing the risk. The weather was not great, and we were going to have to take a longer, alternate return route to keep the cabin within strict pressurization constraints required for the patient. We decided that after leveling off, the co-pilot, engineer and one loadmaster would take a 45-minute nap, and the other three crewmembers would rotate to catch some Z's. This ensured someone was flying the plane with another crewmember backing him up. Allowing more than one crewmember to nap at a time provided everyone a chance to get some useful rest.

We took off into the early morning sky, executed our plan and successfully accomplished our mission. The mission made the *Stars and Stripes* newspaper, and, in an article a couple of days later, we found out the young man made it to the U.S. and was expected to recover well. Our crew felt good about our supporting role in this miracle. How my aircraft commander handled the risks was key to getting this young man the help he so desperately needed.

At the time of this incident, the Air Force instructions did not address in-flight-crew-fatigue management. Years afterward, the Air Force published formal guidance regarding in-flight fatigue management. AFI 11-202V3, *General Flight Rules*, dated Oct 22, 2010, paragraph

9.12.1.4, *Controlled Cockpit Rest*, addresses the situation we faced. It states that everyone must remain at his or her crew station, rest is limited to 45 minutes, only one crewmember can rest at a time, and the rest must be in non-critical phases of flight. It describes almost exactly how my crew decided to mitigate the fatigue and circadian-rhythm risks.

Later, I attended pilot training and subsequently upgraded to aircraft commander. The lessons I learned in the early spring of '97 have stuck with me through four deployments to East Asia and five to the AOR. Identify the risks (fatigued crewmembers), analyze options (take quick naps or try to gut it out), set boundaries and controls (which crewmembers napped and for how long) and execute the plan. My crew did these things well and flew a successful mission. Although the regulations at the time did not adequately address our situation, we used good ORM and CRM to mitigate the risks, accomplish our mission and get this young man the help he needed.

In our current operational environment, crews face challenges similar to what my crew faced that night. Using the guidance, experience and good ORM/CRM can help aircrews mitigate risks associated with the situations they face. The next time you face with a tough situation, use the tools available to lower the risk, accomplish your mission and come home safely. ✈️

The Night of the Missing Crewmember

1ST LT. JENNIFER SMITH

U.S. Air Force School of Aerospace Medicine
Holloman AFB, N.M.

Liquid Library Image

On the last day of flight operations, a ship was steaming back to port. The aircraft commander of an HH-46 helicopter, who also served as the maintenance officer as an additional duty, was spending the last few hours of a three-week deployment reflecting upon the hard work of his maintenance crew. The maintainers had worked hard on this particular trip and invited the AC to play a game of poker that evening.

I'll go ahead and throw it out there that alcohol wasn't involved in this story. In fact, it wasn't even permitted on board. The ship had started back at about sunset the night before, and the time was now 3 p.m. Everything that needed taken care of was, and the poker game was well under way. The thought of having been awake for more than 22 hours never crossed the AC's mind when a "man overboard" announcement was made over the public address system.

Shortly after one helicopter launched in the search effort, the decision was made to put another crew in the air. Having only four ACs and four co-pilots on this deployment, there were now only three ACs and three co-pilots from which to choose. The AC playing poker was not the designated pilot on duty that night; however, having more experience than the other AC, and wanting to avoid making the skipper fly, he volunteered to take the mission.

The AC, having about 800 hours in the HH-46, and a relatively new co-pilot briefed and began the search with a crew chief and rescue swimmer in the back. There were no night-vision goggles at this time, and they were flying search patterns on instruments at night about 500

feet above the water.

One of the crewmen thought he saw something, so a flare was dropped in the water and a search pattern was set up above the light. It was long towards morning, and a little sliver of moon was just coming up.

Since the inexperienced co-pilot wasn't responding to the AC's directions, the AC said, "I have the airplane," without hesitation. Having been looking for the missing person in all directions with eyes inside and outside of the helo, spatial disorientation quickly overcame the crew. The aircraft was swinging violently with a motion similar to that of a pendulum. The AC looked at the flight instruments, pulled in the power and was overcome by vertigo as the helicopter swayed back and forth. After what seemed like forever, the helicopter climbed to nearly 2,000 feet and finally regained control.

Close to the same time, word came in that the missing crewmember had been found. They returned to the ship just as the sun was rising.

Years later, the helicopter pilot from that mission reflected upon those events and was reminded how fatigue played a critical role in his decision-making abilities that night. It wasn't a matter of falling asleep at the controls that put him searching for straight-and-level flight, but after being awake for nearly 24 hours, diminished physical and mental function were definitely factors. He had made three or four poor decisions that night, largely due to fatigue. The moral of the story is to not act brashly. That AC should've never flown the rescue mission and is lucky that his whole crew didn't end up in the water that night. ☛



for an Ill Passenger

CAPT. ZAN SPROLES
53rd Airlift Squadron
Little Rock AFB, Ark.

Liquid Library Image
Photo Illustration by Dan Harman

As most of us already know, summer in Iraq isn't a pleasant experience. Temperatures are well above 100 degrees, and thunderstorms and massive dust storms are commonplace. May 15, 2010 was no different, except this time, the excitement inside the aircraft trumped the heat, turbulence and dust storms that were occurring outside.

My crew was scheduled for a normal passenger ferrying flight that included a run from Ali AB, Iraq, to Ali Al Salem AB, Kuwait. When we arrived at Ali AB, the temperature was 104 degrees and visibility less than 1.5 miles due to blowing dust. We loaded 71 passengers and one baggage pallet, as our passengers were heading home for two weeks of rest and relaxation. Taxi and departure were normal, and then the situation changed.

While scanning for threats, one of the loadmasters noticed out of the corner of his eye that a passenger was showing physical difficulty and then lost consciousness. The loadmaster immediately notified me and the rest of the crew, giving us the location of the passenger. Luck was with us that day as we had an extra crewmember on board, commonly known as "guest help." My primary navigator was scanning for threats while our "guest help" was handling navigational duties. I immediately sent my navigator to the cargo compartment to provide medical assistance.

With 71 passengers on board, there's no room to move around in the cargo compartment. The passengers surrounding the unconscious passenger had no room to move, so they couldn't provide assistance. Because of this, the navigator had to climb over 25 passengers, unbuckle the unconscious passenger and then carry him back over the 25 passengers to the front of the cargo compartment. While this was occurring, the co-pilot slowed the aircraft to reduce the effects of the turbulence, the engineer diverted all air conditioning to the cargo

compartment and the "guest help" called ahead to Ali Al Salem AB to coordinate a medical-response team.

Once the navigator got the passenger to the front of the cargo compartment, he quickly assessed his situation and determined that the passenger was suffering from severe heat-related illness. He quickly loosened the passenger's clothing and applied cold water bottles to the passenger's neck and armpits. The loadmasters queried the rest of the passengers to see if there were any medical personnel on board, only to find out that the sole medic was suffering from airsickness and couldn't help. I then directed the loadmasters to distribute all remaining water bottles to the passengers, including the water set aside for the crew.

The passenger briefly regained consciousness, but was highly confused and disoriented. The navigator did his best to query the passenger, and, in response, got an answer for which he wasn't prepared. The ill passenger started vomiting profusely, covering the navigator many times over. Determined to help, the navigator disregarded the vomit and continued to provide necessary medical assistance.

As we approached Ali Al Salem AB, the navigator determined that there was no way to get the unconscious passenger into a seat and secured for landing. The navigator decided that the only way to secure the passenger was to brace himself against the cargo-compartment bulkhead and hold onto the unconscious passenger. The co-pilot landed the aircraft without incident, and we were quickly met by medical personnel after we shut down.

The quick, decisive and coordinated actions of my crew that day saved the life of the passenger. To top it off, our duty day wasn't over; we still had a few more legs to go. Those were done with one less crew member, one who definitely needed a shower and change of clothes. ✈️



Being Conservative

ANONYMOUS

In the aviation career field, we often talk about using good judgment and making the conservative decision — basically, weighing the potential risks against the potential costs. There are very few instances where mission requirements dictate accepting a greater level of risk than what is normally thought of as acceptable. Missions where greater risk is accepted might include combat, time-sensitive aeromedical evacuations or extremely high-priority taskings that absolutely must be accomplished. Even in these cases, there are often times when “alert” or backup aircraft are ready to take on the mission in case the primary aircraft is unable to takeoff for whatever reason. The point is pushing the envelope is rarely required and can lead to damaging aircraft or injuring personnel. Each situation is different and requires sound decision making.

In the case of bird strikes, sometimes it’s cut and dry whether you hit one or not. Maybe you hear the bird hit your aircraft. Maybe it’s ingested into an engine, or maybe you find evidence of the collision with the bird when you send a crewmember back to look through the windows and investigate. Sometimes, it’s not so clear. When your airfield is located right on the coast, it’s commonplace to encounter birds on departure, approach and in the traffic pattern. All we can do to mitigate the risk of a bird strike while in the aircraft is to follow the

Bird/Wildlife Aircraft Strike Hazard (BASH) guidance, keep our eyes open when near to the ground, make good decisions about avoiding those birds that we do see and report bird activity to the control tower or other aircraft in the vicinity.

Let’s say you’re on takeoff roll in your heavy four-engine aircraft, you’re past decision speed and you see a white streak go past the window and behind you. What do you do? Since you’re already past decision speed, you’re going to continue the takeoff. What else comes to mind? Should you keep your aircraft in its current configuration? Guidance says yes. When in a good position to do so, you should also inform the air traffic controllers of the bird activity at the departure end of the runway and ask them to check for remains because one went right past you. What’s next?

Remember, your aircraft is pretty heavy right now and you need to maintain higher speeds for maneuvering. And, by the way, there are heavy rain showers all around you, which mean turbulence and other hazards. The weather requirements for takeoff have been met by a long shot, and there’s nothing unsafe about this weather except for the fact that you need to pick your way through it. But, you’re still in takeoff configuration with gear and flaps extended, which is hindering your ability to get to a more comfortable and ultimately safe speed for maneuvering.



U.S. Air Force photo

At this point, the decision has to be made if you're going to stay dirty and slow because of the possible bird strike or are you going to get the aircraft flying and get away from this weather? In this situation, the old adage of aviate, navigate, then communicate comes into play. I think that weather avoidance takes precedence in this case, so go ahead and clean up the aircraft and get safely out of the weather. Once that's accomplished, send the additional crewmember aft to look out the windows in the fuselage to see if there's any evidence on the wings of a bird strike. All good decisions so far, right?

A thorough scan of the engines has already been accomplished, and multiple times at that, because you're concerned that the bird might have been ingested into the engine, but everything is working just fine. Should you find a place to hold and wait to see if there are bird remains on the runway, or should you continue with your mission? Getting out of the weather is proving to take much longer than anticipated and following your route of flight appears to be the best choice, according to your weather radar and air traffic control weather reports. Still thinking that there's a good chance you missed the bird completely, you want to continue with the mission. There are many close calls with birds on the coast that turn out to be nothing, but what if a bird had gone down an engine? Would

continuing to operate this engine create more and more damage? Finally, you get the call that says, "You guys had a bird strike and the remains on the runway are pretty chewed up so it's possible that the bird was ingested into the engine." At least now there is confirmation of what you should do, and since you're out of the weather, you've got clear air to run through the appropriate checklists, take the proper action and get the aircraft ready to land.

Once back on the ground, you taxi to your parking spot with several safety and maintenance vehicles waiting for you. After you shutdown, you inspect the damage for yourself and find that several fan blades on the suspected engine are dented and there are bird remains on the underside of the engine pylon. It turns out the damage totaled nearly \$50,000; you might think, "Why did I even consider continuing with this mission if it was possible that I struck a bird?" Lesson learned: We're all extremely mission-oriented, and no one likes turning around. However, making the conservative call usually pans out to be right, and there's no substitute for being cautious. It was the right decision to de-configure the aircraft, get to a safer speed and avoid the weather because safe aviating comes first; however, don't be so mission-focused that you consider taking unneeded risks. ✈️



Did You See Something?

CAPT. RYAN QUINN
6th Airlift Squadron
McGuire AFB, N.J.

Photo courtesy of author

We've all been there: the end-of-the-year local training flight. It seems that 99 percent of a squadron's semiannual currency is accomplished in the last two weeks of the semester. A high-ops tempo pushes currency to the end of the year, by which point there are more "beans" to log than there is time to accomplish them. Every local training flight becomes a race to accomplish as many training events as possible in the allotted time. No instructor wants to be seen as the guy who isn't pulling his weight in the squadron. All of these pressures add up to make local training flights seem like no-fail missions.

This is just the sort of local training flight I was commanding, getting currency for 12 pilots. We were practicing night-vision-goggle assault landings with a ceiling that was creeping closer and closer to pattern altitude. We wanted to get as much accomplished as we could before we lost the visual-flight-rules traffic pattern.

On the fourth landing of the night, during an NVG assault in the rain, the pilot flying thought he saw movement on the runway just as we landed. It may have been an animal. It also might have been a flash of reflection from a landing light. There was really no way to know. But nobody else saw anything, the jet felt fine, and nothing was out of the ordinary. With currency pressing on our minds, there was no time for delay. After a full-stop taxi-back checklist, we were on our way with fourteen more landings before the night was done.

As we touched down at home station for the final

landing of the night, everyone was feeling relieved and proud. Mission accomplished! Twelve pilots were current for another semiannual period, and the flight was completed without incident. Well – almost. The associated picture is not only eye-opening but also serves as a reminder that it could happen to you. Apparently, that flash of movement that one crewmember saw on the runway was actually a deer. And apparently, he was right in the middle of the landing zone because we touched down right on him.

Fortunately, the deer didn't do any damage to the aircraft. It's a testament to the combat toughness of the C-17, but it was also a lot of luck. If the deer had been on centerline, it could've wiped out several of the underbelly antennae. If it had struck the landing gear in a different way, it could've broken a hydraulic line, jammed a brake or damaged a sensor.

I took home a few lessons from that night. On a training mission, it can never hurt to play it safe. After the pilot flying noticed what could've been movement on the runway, we should've spent the five minutes to deplane a crewmember and check for damage to the aircraft. We also should have requested a foreign-object-debris check from airfield management. In this case, the deer was the only unlucky one. Everything else was undamaged, and no further incidents occurred. But next time, it might not work out so well. Don't let currency pressure you into moving the mission. Take the time to investigate, and don't rely on luck. ✈️

The Aviation
Well Done Award
is presented for
outstanding airmanship
and professional
performance during a
hazardous situation
and for a significant
contribution to the
United States Air Force
Mishap Prevention
Program.



CREW OF SPEAR 16
374th Airlift Wing

The Aviation Safety Well Done Award is presented to the crew of Spear 16, 374th Airlift Wing, Yokota AB, Japan, in recognition of its exceptional airmanship. On May 3, 2010, Spear 16 departed Yokota for a 2.5-hour UH-1N night-vision-goggle training sortie to downtown Tokyo. On the return leg, four miles east of Yokota along the Tama River, a master caution light and transmission-chip-detector warning indicator illuminated.

The instructor pilot, Capt. Jun Oh, immediately terminated training and directed Capt. Trey Merrill to fly the aircraft while 1st Lt. Andrew Simpson initiated checklists. Following procedures to “land as soon as

possible,” the crew used its night-vision goggles to quickly assess precautionary landing sites while Captain Oh declared an emergency with air traffic control. Due to its superior situational awareness, the crew recognized the safest site was Tachikawa Army Airfield, which, although closed and unlit, offered an obstacle-free surface suitable to sustain the UH-1N’s weight. On the ground, the crew continued to respond, performing an emergency engine shutdown. The crew of Spear 16 demonstrated exceptional procedural knowledge, crew resource management, cockpit discipline and airmanship, ensuring the safe recovery of three lives and a \$2.6 million UH-1N aircraft. The exceptional performance and commitment to safety of the crewmembers of Spear 16 reflects great credit upon themselves, Pacific Air Forces and the United States Air Force. ♀



MAJ. JEREMY WIEDER
173rd Fighter Wing

The Aviation Safety Well Done Award is presented to Maj. Jeremy Wieder, 173rd Fighter Wing, Kingsley Field Air National Guard Base, Oregon, in recognition of his exceptional airmanship. On Oct. 15, 2010 in support of a major weapon-system display at Laughlin AFB, Texas, Major Wieder was flying an F-15D with a Laughlin AFB instructor pilot in the backseat. During one of the engagements, while executing offensive-basic-fighter maneuvers against another F-15, Major Wieder applied flight controls to reposition the jet for another simulated gunshot attempt. At this point, the jet rapidly departed controlled flight due a rare and unusual flight-control malfunction that has no emergency-procedure guidance from the aircraft manual. Major Wieder attempted to recover the aircraft twice, each time the aircraft responded with worsening severity of departure from controlled flight. Major Wieder tried a new technique by using extremely precise flight-control inputs that enabled the aircraft to return to level flight, just prior to reaching the ejection altitude for uncontrolled flight. Upon performing a visual exterior inspection by his flight lead, the flight-control malfunction was identified. He performed a controllability check and devised flight-control inputs to safely land the aircraft. Major Wieder flew a flawless approach and executed a perfect landing. Major Wieder’s exceptional performance and commitment to safety reflects great credit upon himself, the Air National Guard and the United States Air Force. ♀

New Ground Safety Chief Shares His Goals



MASAO DOI

Media and Force Development Division
Air Force Safety Center
Kirtland AFB, N.M.

Bill "Top" Parsons arrived here as the new Chief of the Ground Safety Division, March 3. He is charged with primary responsibility for Air Force ground safety programs worldwide.

Prior to his current assignment, Mr. Parsons served in various leadership positions at Headquarters, Occupational Safety and Health Administration, in the Office of Construction Standards, Guidance and Enforcement and Office of Construction Services, Washington, D.C. During his 36-year career as a safety and health professional, Mr. Parsons served 17 years as a safety professional in the Air Force on active duty and owned a safety consulting business where he developed safety and health programs and conducted training throughout the U.S. and several foreign countries.

He sat down for an interview on April 4.

Q: You've had extensive experience on Air Force active duty as well as an OSHA manager. What does that experience bring to your new job?

What it brings is a foundation of experience that I'll be able to use in helping us continue to lower the number of fatalities and accidents that are unfortunately occurring with our young men and women throughout the Air Force. Our primary mission, of course, is to fly, fight and win, and, unfortunately, that means we're going to suffer some losses, but some losses we don't have to suffer, and those are the ones that are preventable. Preventable losses are, to me, losses that result from fatigue, overextending your limitations, inadequate training, drinking and driving and the list goes on, and those are all preventable as far as I'm concerned. My job here is to take my experience from the past 36 years as a safety and health professional and work with my team to prevent those types of injuries and fatalities.

Q: How much is teamwork a factor in what you do in getting the job done to prevent mishaps?

I learned a long time ago as a safety professional with the Air Force and as a business owner that I can't do anything myself. I have to have the support of the staff and the folks in the field. We have hundreds of extremely well-trained safety and health professionals in the field who have a great breadth of experience and knowledge. In order for us to be successful, we have to take the successes the men and women in our Air Force have had and share them across the board with people performing like duties. That will help them save time and money and prevent injuries and fatalities. When I talk about a team concept, we're the folks that take the good that we find from around the world and we share that with others. It really gives us an opportunity to focus on the positive. And, you have to have a team to do that. Whether you have 36, 46 or 56 years of experience really doesn't matter. What matters is have you done what works and can you teach others to do what works? And, that's what we have to get from the folks in the field and the staff we have here.

Q: What are your goals as the Chief of the Ground Safety Division here? What do you hope to accomplish?

The number one thing I hope to accomplish is that we prevent more fatalities, job-related injuries and illnesses and enhance our ability to comply with OSHA requirements. I want the ground safety people around the Air Force to understand we can't do it without them. They're the strong point in this chain, in this team, and we want them to understand we're here to support them. They are the folks who really make it happen. When the rubber meets the road, the folks out there doing it every day are the ones preventing the fatalities. It's the folks out there doing the inspections, doing the training and doing those accident investigations who will allow us to prevent recurrence, and my main goal is to work more closely with people in the field and have them understand what a valuable asset they are.

Q: Tell me about your other goals, programs, priorities and initiatives?

I know from experience as a young three-level, five-level and seven-level safety professional in the 70s and 80s that military and Department of Air Force

civilians do a lot of hard work in the field. The better support we provide them with training and education, the better safety professional we're going to have and better prepared they're going to be to progress within the ranks, and this goes for all Air Force safety professionals — military and civilian. Chief Master Sgt. (Burrell) Hancock, Air Force safety enlisted career field manager, and I have talked a little bit about that, and we're moving forward on some initiatives to bring certification programs to all Air Force safety folks, both military and DAF civilians. We're going to make that happen. It's only going to help us prevent injuries, prevent fatalities, plus, it better prepares our safety professionals for that next step. The Air Force did that for me. Without the Air Force Safety program, I would never have been able to work for OSHA. I would never have been able to have my own company. I would not be in the position I am today. But, I was lucky. I had someone whom I was working for that pushed me, and guided me, told me I needed to do these things. That's what I'm going to bring to this job. We're going to encourage folks to take that next step. We believe doing that is going to help us with our bottom line, which is, again, our mission — fly, fight and win, and, in order to have our team be able to do that, they have to have the tools to do the job, and it's our job to help them get those tools.

Q: Do you have a message you'd like to share with the readers of Wingman magazine?

We have an openness and willingness to work with folks to reach our goals. I think everybody — no matter who you are or where you are ... you don't want to see people injured or killed, and we have to work together to prevent that. I want to let everyone know that we're here to work with you, to support you ... we're not here to tell you why you can't do things. We're here to tell you how you can do things safely. Now, of course, we want everybody to use the proper chain of command when it comes to questions, issues and ideas, but, at the same time, understand that we're here to work with you. If you call here, we're going to do our very best to support you in any way that we can. The message I want to send out today is — give us an opportunity to prove what we're going to be able to do for you, and I think working together, we'll all see the successes of the team that we have. 🇺🇸

The Choice is Yours

AIRMAN 1ST CLASS MORGAN M. MCGREW
40th Flight Test Squadron
Eglin AFB, Fla.

One of the proudest moments of any Airman's life is graduating from basic military training. I'll never forget that day. I didn't know if my parents were going to make it to my graduation ceremony. The scene: I was standing and saluting the American flag for the first time as a United States Air Force Airman. There was a light chill in the air, and sprinkles of rain fell from the sky. I heard a familiar clearing of the throat and looked out of the corner of my eye. There stood my mother and father, hands over their hearts, tears in their eyes and singing away to the national anthem as it played majestically over Lackland AFB, Texas. My mother had just gone through her second hip-replacement surgery, but still she stood there in the rain, out of her wheelchair, tall and proud.

Now, let's rewind back a few years to the event that almost made this proud moment only a figment of one's imagination. We all think, "It won't happen to me!" That's what I said, and I almost lost my life. The night started off just like many others: meeting up with friends, drinking casually, getting in a car together and heading to another spot to drink. The designated driver decided to drink. When it was time to leave, she said she

was fine. She claimed she only had a couple. Mistake number one was getting into a car with someone who said, "I've only had a few."

As cliché as it sounds, one is too many. Here lies the proof. We were the only ones on the road. There were five of us in the vehicle. It was early in the morning, still dark and a blanket of fog slowly wafted in hiding the road from us. Mistake number two – we were on the road in uncertain weather conditions. The next thing I saw was the driver reaching over to flirt with the passenger. Mistake number three was not speaking up when the DD wasn't paying attention to the road. I felt the car jerk to the right, then to the left, and suddenly, we were heading straight for a tree at 60 mph. I heard the tires screech in a high pitch, then all seemed to be silent and in slow motion. The next thing I felt was glass and blood shooting into my face. Is it my blood? Is it my friend's blood? Am I alive or dead? I opened my eyes to find I was in between the head rest of the passenger seat and the roof of the car. I cried out, "Is everyone OK?" I heard two voices when I should've heard four. The place where I landed was tight enough to keep me from going



Liquid Library Image and U.S. Air Force Photo by Dennis Spotts
Photo Illustration by Dan Harman

through the windshield but loose enough that when the impact was over, I could easily slide out. I then heard someone gasping for life outside of the car. I discovered that two people had been ejected from the car into the woods. I climbed out of the car and called my sister.

The scene was something out of a horror film. I was walking down the road in the middle of the woods in the early hours of the morning. The fog was low, and a full moon lit up the sky. I had on a white shirt, and blood covered the right side of my arm and around the collar. I heard sirens off in the distance. The driver had a broken jaw. One of my friends had a skull fracture, while the other's injuries resulted in a stay in intensive care for a long time. I had pieces of glass stuck in my arm. The one person wearing a seat belt came out of the wreck physically OK. Mistake number four – I was not wearing a seat belt. To this day, I have numerous scars to remind me of that night and the mistakes I made. I now can't drive at night or in the rain; I have to pull to the side of the road. If I see a wreck on TV or in a movie, I have to leave the room. I get very emotional and sick to my stomach.

Let's return to present day. To think I would've missed the chance to enjoy one of the proudest moments in my life because of a series of stupid mistakes brings tears to my eyes. I could easily have lost my life. I could've easily lost four friends. But for some reason, I was saved. Now, my parents get to touch my hand, not my coffin.

The decisions you make don't just hurt you if they go wrong. I'm one of fifteen kids. That's a lot of hearts that could've been broken and lives affected by my one decision to get in the car with someone who had "just a few." Think of it this way; Miraculously, my life was spared. But will yours be spared? One decision to get in a car with a drunk driver, or to decide to drive when you've had a "just a few," could be the last ride you'll ever take. Every Airman in the United States Air Force is held to a higher standard. You made the decision to defend your country everyday! Now make the decision to defend your life everyday or help save the life of another! Even though you may be doing everything right, keep in mind that the decisions you make can impact others. ☒

Travel Safely – Fight Fatigue

LARRY JAMES

Ground Safety Division Contractor
Air Force Safety Center
Kirtland AFB, N.M.

Thank you for your hard work and constant efforts to keep our Airmen safe. We're currently on pace to beat the Secretary of Defense's safety goals for FY11 in every category. Through vigilance and continued effort, we can make this the safest year the Air Force has seen in decades. While we're doing well in relation to reducing our fatality numbers, the families of those who have perished can't celebrate our achievements with us. One fatality is too many, and we must do our best to understand the possible causes of our mishaps so we can prevent more fatalities from occurring. Families should not have to hear the news that their son, daughter, father, mother, husband or wife has died in a needless, preventable accident. Most of our PMV-4 fatalities have been single-vehicle mishaps. While there may be several different factors associated with each mishap, we must

consider all possibilities. Let's take a look at fatigue.

How many times have you caught yourself fixated on the road ahead, hypnotized by the monotony of the highway, when you suddenly realize that you've zoned out and don't remember the route you just took?

Good drivers who spend long hours on the road realize that fatigue can be fatal. Extreme fatigue attacks a driver's mental ability and muscular coordination. Fatigue hampers a driver's ability to judge distances, speed and driving conditions. These circumstances can lead to a serious accident.

Many times fatigue may also produce a mental state which will deceive drivers into believing that they're capable of driving safely. When tired, drivers often imagine conditions that don't exist. Reacting to an imaginary condition can be disastrous.



U.S. Air Force photo by Dennis Spotts
Photo Illustration by Dan Harman

The Federal Motor Carrier Safety Administration states, “No driver should operate a motor vehicle, and a motor carrier should not require or permit a driver to operate a motor vehicle, while the driver's ability or alertness is so impaired, or so likely to become impaired, through fatigue as to make it unsafe to operate the motor vehicle.” In fact, the Agency has established regulations concerning maximum hours of work driving time and rest for commercial drivers.

Why have these regulations been established? Experts have concluded that driver performance deteriorates, driver alertness diminishes and accident probability increases as driving time increases. The frequency of accidents dramatically increases after about seven hours of driving time. Drivers should be aware of the signs of fatigue so that they may take measures to combat its effects.

While you're still alert, you'll sit somewhat quietly in your seat. As you begin to tire, you become restless, squirm in your seat, stretch, rub your eyes and maybe start to crack your knuckles. A driver may experience short lapses of attention, but, as fatigue sets in, you pay less and less attention to the instrument panel and the rear- and side-view mirrors. A driver may even stare fixedly ahead, actually appearing to be in a trance.

It's at this point when driving patterns change. There's less steering, irregular or erratic speed changes, weaving back and forth, and finally, crossing the center line or drifting off the road. This is the time when a fatigued driver is a hazard to him or herself as well as others.

Here are some precautions you can take to combat fatigue:

1. A driver shouldn't operate a vehicle when tired, ill or when any other condition makes his or her driving ability less than 100 percent.
2. A driver shouldn't operate a vehicle for long stretches of time without adequate breaks or rest.
3. Frequent rest stops should be made. Any activity which substitutes a different physical act for the monotony of driving helps refresh a driver.
4. A drink of coffee or water is often enough to increase alertness.
5. Fatigue comes on quickly. Drivers should get off the road before they fall asleep at the wheel. A driver who is dog-tired should pull off the road and take an extended rest break.
6. Don't use alcohol or drugs of any kind at any time. Many drivers feel that drugs like caffeine or pep pills (e.g., NO-DOZ) can increase alertness and efficiency so that they can operate a vehicle beyond their limitations. Drugs may increase alertness for a short period. However, their use is often followed by headaches, dizziness, agitation or irritability, decreased power of concentration and marked fatigue.

An important factor to note is that the use of drugs can interfere with the body's normal warning symptoms of drowsiness and fatigue. Drivers can use up their body energy without realizing it until they suddenly collapse. They're given a false sense of self-confidence and don't realize that their driving ability and alertness are decreasing. Don't rely on something that provides only false security.

Learn to recognize the signs of fatigue, follow safe driving practices and get the rest required to safely operate your vehicle. 🚗

SWAPS SPOT ON SAFETY



LARRY JAMES

Ground Safety Division Contractor
Air Force Safety Center
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Liquid Library Image and U.S. Air Force Photo
Photo Illustration by Dan Harman

Lingering Effects

On a warm, summer morning, Airman 1 (A1) was riding a motorcycle to work. While travelling at more than 80 mph in a 35 mph zone, A1 entered an S-curve. A1 drifted to the outside of the curve, and the front tire struck the curb; the motorcycle skidded along the curb as A1 tried to maintain control. Ultimately, the motorcycle jumped the curb, and A1 was ejected into a utility pole. A1 died at the scene of the mishap. Alcohol and fatigue were factors in this mishap.

Lessons Learned

You might think that the poor risk management decision of driving more than 80 mph in a 35 mph zone would be the main problem in this mishap, and it was a terrible decision. But A1's poor decisions started earlier in the morning, the night before and even weeks before this mishap. While driving 40 to 50 mph more than the posted speed limit significantly increased A1's risk, other factors multiplied that risk exponentially. The night before the mishap, A1 spent several hours at the

local watering hole and consumed several drinks. On the morning of the mishap, alcohol was still affecting and altering A1's reactions and perceptions. For the last several weeks, A1 knew that the tires on the motorcycle needed replacing but did not replace them. Any one of these factors could have resulted in this mishap. Driving more than twice the speed limit on only a few hours rest, while under the influence of alcohol and on worn-out tires, almost guaranteed the end result. All of our decisions affect our future. Make good decisions so you can worry about your kid's education and your retirement. Don't make your family worry about your funeral arrangements.



Liquid Library Image

“Board Use Only”

On a sunny, summer day, Airman 1 (A1) decided to go to the beach for some rays and a little body surfing. After a few surfing attempts, A1 became dissatisfied with the location on the beach because of the lack of suitable waves. Just down the beach, A1 saw some people skim boarding and decided to move in that direction because the waves looked better. A1 passed a sign on the beach indicating the area was “for board use only” and proceeded into the surf. In the midst of standing after body surfing a wave, a skim board struck A1 in the back, breaking the spine and causing paralysis. Alcohol and fatigue were not factors in this mishap.

Lessons Learned

A1 used bad judgment and poor risk management in deciding to disregard the signs that limited the use of that area of the beach. We sometimes don't understand the thinking that goes into warnings and limitations that affect our lives. Usually, we just see these warnings as a hindrance to our fun. Besides, we think “nothing will happen to me anyway.” Warning signs are usually “written in blood.” This means that the warnings are based on previous events that caused someone else to be injured or killed. If there are warning signs posted, they are there for good reason. Read the signs and remember that bad things can happen to good people.



Liquid Library Image

Round the Mountain

Over the 4th of July weekend, Airman 1 (A1), Airman 2 (A2) and about twenty friends decided to go party on the mountain. A1 and A2 left the dormitory, picked up a keg of beer and took the keg to a mountain campsite where they planned to stay overnight. They were followed by four other vehicles and about 20 friends. Upon arriving at the campsite, the keg was tapped and the drinking began; it continued throughout the evening and night. Early the next morning, various people stated the need to return to base, so cars started leaving the campsite. A companion offered to drive for A1 and A2, but the Airmen assured the group that they were alright. At some time during the trip down the mountain, the truck A1 and A2 were in went off the edge of the dirt road and fell more than 1,000 feet down the mountain side. Even though A1 and A2 were wearing seatbelts, the mishap resulted in the deaths of both Airmen. Alcohol and fatigue were factors in this mishap.

Lessons Learned

A1 and A2 did not make sound risk management decisions leading up to this mishap, and their friends failed to be good wingmen. Drinking and driving is never a good idea, but combining slow reactions with altered perception on a road where all that stands between you and a 1,000-foot drop is a 12-inch dirt berm and you have a recipe for disaster. Combine a blood alcohol level of more than three times the legal limit with being awake for over 24 hours, and you wonder how they got as far as they did. On top of the poor perception and reactions, it was determined that A1's vehicle was going much faster than the recommended speed limit when it went over the edge. I believe all of these failings are small in comparison to the biggest failing of all. The companion who offered, but didn't insist, to drive A1 and A2 back to the base was the ultimate failure. If you know that someone is under the influence of alcohol, you cannot

accept their determination of their ability to do anything. Being a good wingman isn't about being someone's friend, it's about protecting that person from harm, often self-inflicted harm. Be a good wingman; make the hard decision and save someone's life.



Liquid Library Image
Photo Illustration by Dan Harman

Spiderman

On Labor Day weekend, Airman 1 (A1) decided to attend a party in a friend's dormitory room. It wasn't an outrageous party, just some games and watching the newest action movie on the big-screen television. However, there were a few people smoking at the party, and after a while, A1 decided to get some fresh air. A1 went from the living room through the bedroom to the third-floor balcony to get away from the smoke. As A1 stepped out onto the balcony the door shut and locked. When A1 attempted to re-enter, there was no way in. A1 knocked loudly on the door, but the noise of the party prevented anyone from hearing. A1 noticed a narrow ledge (1.5 inches wide) leading around the exterior wall to a window where A1 could attract the attention of someone at the party. A1 successfully traversed 10 feet of ledge but, when attempting to wave to the partygoers, fell three stories to the ground below. A1 fractured both

wrists as a result of the fall. Alcohol and fatigue were not factors in this mishap.

Lessons Learned

A1 showed poor judgment and a lack of risk management decision making by choosing to traverse the narrow ledge. Just because we see something done on television or at the movies doesn't mean that it's something we should try. We don't have the benefit of safety harnesses, blue screens or stunt coordinators to ensure that if things go awry we'll be OK. A1 was actually very lucky to have only broken both wrists. Many people have died from falls from heights much less than three stories. If you find yourself in a bad situation, think about all of the possibilities and outcomes. Use your "Spidey Senses" and you'll find that in most cases waiting for help is the best decision. 🚑



DEPARTMENT OF THE AIR FORCE
OFFICE OF THE CHIEF OF STAFF
UNITED STATES AIR FORCE
WASHINGTON DC 20330

APR 19 2011

MEMORANDUM FOR ALMAJCOM-FOA-DRU/CC
DISTRIBUTION C

FROM: HQ USAF/CV
SAF/IE

SUBJECT: 2011-Year of Motorcycle Safety

This year, we are asking every commander, every rider, and the rest of our Air Force family to get focused and committed to motorcycle safety.

Riding motorcycles is an exhilarating form of transportation and recreation which also has a higher level of inherent risk. Airmen, both military and civilian, who choose to ride motorcycles must do everything they can to mitigate these risks every time they ride.

Both of us are avid, life-long, motorcycle riders and can speak from experience. Each rider must exercise special caution, know his/her limitations, and make the right decisions when it comes to speed, reckless riding, and alcohol use. Proper use of personnel protective equipment can save your life, so always dress for the crash and not the ride. Treat riding as you would any combat mission by checking your equipment, gear, training, and attitude.

Motorcycle fatalities are up over 150 percent since January 2011, compared to the same period last year. *These losses are unacceptable for our Air Force.* The Air Force has already suffered one permanent total disability and five fatal motorcycle mishaps. All had two common causal factors: no automobiles were involved and the rider lost control of his motorcycle. All were preventable tragedies and were devastating to our units, communities, and our Air Force family.

Commanders and supervisors...your leadership is crucial! Motorcycle safety mentorship is more important than simple e-mail notices and must include face-to-face time with your Airman riders. Senior leaders and senior riders must be in front of this program to ensure that wing-level activities foster positive riding attitudes, behaviors, and build necessary riding experience.

All military members must complete an approved motorcycle safety rider course to operate a motorcycle on a roadway. AF-led joint bases shall provide Basic Rider Course training without cost or delay to all service members. Many Airmen are volunteer Motorcycle Safety Foundation (MSF) instructors or desire to become instructors. This is an opportunity for commanders and supervisors to invest in building MSF courses on every base. At the end of the day, having sufficient volunteer instructors ensures MSF training is sustainable.

We encourage each installation focus on motorcycle safety and motorcycle mentorship activities to build strong riding relationships and re-emphasize public awareness. Take the opportunity to publicize motorcycle awareness events such as Ride Your Bike to Work Day (a.k.a. Motorcycle Mondays), mentor rides, maintenance and safety workshops, or teaming with the base exchange or community centers to host bike shows and riding demonstrations. Many base exchanges have begun to offer motorcycle safety gear and personal protective equipment...does yours? These opportunities are just a few examples of positively influencing and fostering a traffic safety culture and are mutually beneficial for the base population at large and the riding public.

We want each of you to have a wonderful riding season, so watch out for yourself and your fellow Airmen. Each rider is ultimately accountable for his/her individual safety decisions and we're counting on you to maintain your focus on safety. Together, we can save lives!


TERRY A. YONKERS
Assistant Secretary
Installations, Environment & Logistics


PHILIP M. BREEDLOVE
General, USAF
Vice Chief of Staff



Liquid Library Image
Photo Illustration by Dan Harman

Are You a Good Wingman?

STAFF SGT. JOSHUA A. RICHARDS

Human Factors Division
Air Force Safety Center
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“Bartender, another round for me and my friends!” The bartender lines them up, and the group downs its eighth shot and starts on beer chasers. One member of the group asks, “Where’s Joe?”

“I don’t know. First, he doesn’t want to drink with us. Then, he dances the night away with that lady I was looking at.

“All I needed was one more shot of liquid courage. Then I would’ve asked her to dance.

“There he is. It looks like the woman is giving him her number.”

Why Joe? Why not Joe? Joe planned ahead. The guys wanted to get tipsy, and Joe decided that he would be the designated driver. Tipsy guys are not on their game, so Joe gets the girl. Joe makes sure at the end of the evening the “not-so-lucky” members of the group get home safely, and by the way, he has a date next Wednesday night with the girl he met. A good wingman looks out for you.

How about another example?

Joe wakes up well-rested. The car is packed, and the fuel and oil are good. Joe grabs a light breakfast and his coffee and heads out to the car for his road trip to see his grandma for her birthday. He takes one last look around before he takes off. The house is locked up, his friends know where he’s going and his supervisor has signed off on his leave. He kicks the tires, checks the lights, programs the GPS and off he goes. Joe has planned for

most possibilities along his route. He knows when and where to stop, he take breaks and lets his grandma know when he should arrive. Joe makes it to his destination with no problems and celebrates his grandma’s 89th birthday the next day. “Joe has always been a good kid; he’s always looking out for me,” Grandma says with a smile. A good wingman cares.

Here’s the last one and I’ll let you get back to your work.

Joe finally upgrades his motorcycle. He loves his 600 GSXR, but he has always had his eye on a ‘Busa. He saved every penny he could and skipped all of the “extras” that the rest of the guys were getting so that he could finally get “that” bike. Joe picks it up from the dealer, straps on his helmet, gloves and the rest of his PPE and eases out of the parking lot. Slow, steady and cautious, he rides home. Joe has to get used to the bigger bike. It’s much more responsive than his previous one. Joe arrives home and parks the bike in the garage. Tomorrow, he has the advanced-rider’s course for street-bike riders at the track bright and early. He knows that he wants to get out there and hit those corners, but he first needs to become more familiar with the new bike. Joe knows that he would hate to lay his new bike down (or worse) the day that he got it. A good wingman plans ahead.

We know that our Airmen have what it takes: courage to stand up for what’s right, a caring attitude and an ability to plan. Are you a good wingman? 🍷



Liquid Library Image

Water Safety Learned the Hard Way

LT. COL. NATE ALLERHEILIGEN
50th Airlift Squadron
Little Rock AFB, Ark.

On Nov. 1, 2008, I was enjoying an unseasonably warm, Arkansas day at Heber Springs Reservoir with my family and friends. The water temperature was still in the upper 70s so it was a great day to be on the lake. We started the day with some boating on a pontoon boat while our friends were riding their Jet Skis. After awhile, they invited me to take one of their Jet Skis for a spin. Not having a lot of experience on small powered watercraft, I took it easy at first, keeping my distance from other boats and remaining vigilant of those around me. Later on, I took my younger son on my lap for a spin while my older son, who was 11 years old at the time, was riding the other Jet Ski. He had ridden several times before and was conscientious and careful in how he rode. We were having a really nice time and enjoying the day together.

At one point while we were riding our Jet Skis, I came up behind my son and noticed I was getting too close to him. I headed off in a wide-sweeping left turn to get some distance from him while he headed off to the right. My younger son was “helping” me steer and run the throttle. As I looked over my shoulder for my older son, I couldn’t see him so I thought we were safe to keep turning. The water spray from the Jet Ski got in my eyes for a moment as we rolled out of the turn. Then I saw him.

Directly ahead of me and in my path was my son on a collision course. We were maybe 50 yards apart and each doing 20 knots or more headed right for each other. I barely had time to react, so I did my best to steer away without capsizing or stopping directly in his path. Unfortunately, he kept turning slightly left into my path, and we collided. My Jet Ski went up and over the left front of his, flying two to three feet above the water and stopping 50-60 yards away.

I immediately turned around and thought for a moment that he was OK. He was sitting erect on his craft with his hands by his side. Then it happened. He turned to the right, almost as if on purpose, and fell face first into the

water. That image will haunt me forever.

At that moment, instinct kicked in, and I instantly jumped into the water and began a life-saver crawl to him. It seemed to take forever to reach him, the whole time his face was in the water. I instantly noticed the blood in the water as I turned him over. Praise God, he began to breathe and do the “funky chicken” — a series of spasms common when a person who has blacked out regains consciousness. He had a huge wound above his left ear that was bleeding profusely. I didn’t have the time or opportunity to do any more triage, so I headed back to the Jet Ski. No one else was around us, and we were exactly in the middle of the lake with more than a half-mile swim in any direction to reach shore.

Fortunately, he was wearing a vest-style life preserver and was floating without effort. I grabbed the back of his vest and began pulling him back to my craft where my other son was patiently waiting. My injured son was responsive to my voice and could move his arms — he even tried to help swim. With his help I was able to get him onto my craft. I started the motor and the three of us raced back to shore.

When we reached shore, I helped him into a prone position on the concrete, secured his head and neck while applying direct pressure onto his head wound with my own shirt. By then our friends had already called for an ambulance. The ambulance quickly arrived and took him to the local hospital which was less than 10 minutes away.

He was evaluated at the local hospital and found not to have any significant head, neck or back injuries. The cut on his scalp was more than they wanted to handle at their facility and he had lost a lot of blood, so they airlifted him to Arkansas Children’s Hospital in Little Rock via helicopter. By the time we drove the 75 minutes to the hospital, he was lucid, responsive and doing well. He received 11 staples to close the head wound and was released that night.

There are several lessons to be learned by this life-changing experience. The paramount discovery is that life preservers save lives! Without the vest, he may have sunk beyond my reach before I could get to him. There is no way I could’ve pulled my son 75 yards through the water and onto that Jet Ski had he not been wearing a jacket. A big kid for his age, he was 5 feet 7 inches tall and weighed 160 pounds at the time. Likewise, had I not had my life preserver on, I likely would have drowned from exhaustion trying to bring him back to safety.

I also learned the importance of following all safety precautions in the owner’s manual of the water craft. As vigilant as I was, the added distraction of having my younger son in my lap made the maneuvers we were doing dangerous — and almost tragic. Finally, water rescue, first aid and CPR courses are a must! Knowing how to properly save and treat a loved one, or even a stranger, is a critical skill that everyone should gain. ☞

Personal Watercraft – How Informed are YOU?

RICHARD D. PAULSON

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Scenario: Somewhere on a lake on a warm summer day

“Wow, was that ever close! That guy has probably never taken any kind of water safety class, or if he has, he certainly didn’t learn anything. I wonder if he knows what the law says about operating a personal watercraft (PWC).”

Every state has different laws and regulations for operating a marine vessel, which includes PWCs. Congress establishes the laws, and various federal agencies enforce state regulations. The U.S. Coast Guard and National Transportation Safety Board are working together to mandate every state require ALL marine-vessel operators pass a national-license examination. This may have a huge effect on the most recent boating-accident statistics.

According to the Coast Guard’s 2008 recreational boating statistics, there were 4,789 reported boating accidents in the country resulting in 709 deaths and 3,331 injuries. Additional Coast Guard recreational boating accident data include:

- Recreational boating accidents caused \$54 million in property damage.
- More than two-thirds of all fatal boating accident victims drowned.
- Among the drowning victims, 90 percent were not wearing a life jacket.
- Only 10 percent of the fatalities occurred on boats where the operator had received boating-safety instruction.
- Seven out of 10 drowning victims were on boats less than 21 feet in length.
- Alcohol was a leading factor in deadly boating accidents.
- Eleven children under the age of 13 died in boating accidents.
- Open motorboats were the most common type of vessel involved in boat accidents.

The Coast Guard also identified the top five contributing factors in boating accidents:

- Careless or reckless operation
- Operator inattention
- No proper lookout
- Operator inexperience
- Improper passenger or skier behavior

The unfortunate part of these statistics is that each and every one of these mishaps could’ve been prevented. Just a little bit of self-imposed willpower and some time spent learning how to safely operate a PWC or boat is all it takes. Can you imagine if we allowed people to operate a vehicle without ever passing a written exam? It wasn’t all that long ago that there were no rules for operating an all-terrain vehicle, but that all changed very quickly when statistics pointed out that the lack of regulations was a major contributing factor in serious injuries and deaths.

Unfortunately, statistics don’t really mean a lot to the average person until “it” happens to someone they know, like a co-worker, a relative or maybe even themselves. But wait a minute; accidents always happen to others, never me! ☹️

Personal Watercraft (PWC) Safety Tips:

1. Learn how to operate the PWC before getting on it. They’re all a little different.
2. Wear a life jacket. Federal law requires anyone on a PWC to wear a life jacket.
3. Stay at least 100 feet away from other watercraft, water skiers, divers and swimmers.
4. Know both the state and federal laws before operating a PWC.
5. NEVER operate a Jet Ski without a lanyard. It shuts off the engine if the operator falls off.
6. NEVER operate a PWC at night.

Statistics show that PWC accidents cause far greater personal injuries than other boating mishaps.

Operator inexperience was responsible for 95 percent of all accidents. Two common factors were speed and improper operating technique.

State Boating Licensing Laws*

State	Mandatory Safety Education	Mandatory Operator Licensing	Is License Certificate Dependent on Passing Exam?
Alabama	No	Yes	Yes
Alaska	No	No	No
Arizona	No	No	Yes
Arkansas	Yes	No	Yes
California	No	No	n/a
Colorado	Yes	No	Yes
Connecticut	Yes	Yes	Yes
Delaware	Yes	No	Yes
District of Columbia	Yes	No	Yes
Florida	Yes	No	Yes
Georgia	No	No	No
Hawaii	Yes	No	Yes
Idaho	Yes	No	Yes
Illinois	Yes	Yes	Yes
Indiana	No	No	No
Iowa	Yes	No	Yes
Kansas	Yes	No	Yes
Kentucky	No	No	Yes
Louisiana	No	No	n/a
Maine	Yes	No	Yes
Maryland	Yes	No	Yes
Massachusetts	Yes	No	Yes
Michigan	Yes	No	Yes
Minnesota	Yes	No	Yes
Mississippi	Yes	No	Yes
Missouri	No	No	No
Montana	No	No	Yes
Nebraska	Yes	No	Yes
Nevada	No	No	n/a
New Hampshire	Yes	No	Yes
New Jersey	Yes	Yes	Yes
New Mexico	No	No	n/a
New York	Yes	No	Yes
North Carolina	No	No	Yes
North Dakota	Yes	No	Yes
Ohio	Yes	No	Yes
Oklahoma	No	No	No
Oregon	Yes	No	Yes
Pennsylvania	Yes	No	Yes
Puerto Rico	Yes	No	Yes
Rhode Island	No	No	n/a
South Carolina	Yes	No	Yes
South Dakota	No	No	n/a
Tennessee	No	No	n/a
Texas	Yes	No	Yes
Utah	No	No	n/a
Vermont	Yes	No	Yes
Virginia	No	No	No
Washington	No	No	No
West Virginia	Yes	No	Yes
Wisconsin	Yes	No	No
Wyoming	No	No	No

*Check your local, state and federal laws for changes.



A Mural Says it All

MASTER SGT. JAMES SANSCRAINTE
Davis-Monthan AFB, Ariz.

It's day one – 126 people, most of them meeting for the first time, stand at parade rest in four ranks. They're carrying rifles, machine guns, grenade launchers and back packs filled with ammunition. They quietly look around, wondering where the other Airmen are from, looking at sleeves so they know who's who. There is a bit of chit-chat in the ranks, mostly from the folks getting ready to go back home in a day or so. A master sergeant stands in front of them, welcoming them, giving his expectations and reminding them of the challenges they

must meet during this deployment.

All the while evaluating how great a challenge it will be to forge these 126 Airmen into a highly functional team. The flight commander, a lieutenant, speaks next. Young, a bit timid but well-spoken, he says he's looking forward to working with everyone. Then, the commander, a lieutenant colonel, staunch, stiff-backed and loud, addresses the flight. He gives a few examples of mistakes made by those in the not-too-distant past, which must be avoided by all means. Then, he tells the Airmen he needs them to be "wolves and not sheep" and pauses. Some know exactly what he is talking about.



Photo courtesy of author
Photo Illustration by Dan Harman

Others, having only a year or so in the Air Force, wonder a bit. The commander explains that they're here to protect the vast resources and all the other Airmen, Soldiers and Sailors on this base, the "sheep." He explains that the sheep get to go about their day without being wary of the threat, allowing them to concentrate on their jobs and rest. Because they know the wolves are constantly vigilant and watching over them, they can concentrate on their mission without worry of attack.

"So who are you?" the lieutenant colonel shouts at them. "Wolves!" they shout back. "Who are you?" he shouts louder. "Wolves!" they shout back, a bit more enthusiastically. At that moment, along with conjuring

magical amounts of everlasting vigilance from the Airmen, the commander has inspired an artist within the ranks.

It takes enthusiasm and meaning to inspire an artist. That's exactly what happened. Because Airman 1st Class Derek White is a genuine artist, he chose to use the meaning behind our commander's vision to guide him as he designed his flight's barrier mural design. In case you don't already know, the barrier mural is a tradition we use to decorate the many pieces of blast mitigation that are placed around downrange military bases. Not really, that's just a side effect. A barrier mural is a legacy gift. The names on it remind us of those who've been "here," who've put their backs into "this place," who've sweat here, bled, laughed, cried and, sometimes, died here.

The names on the barrier remind us of those who were here completing the mission while their families, children, husbands and wives celebrated holidays, played football games, baseball games and watched the seasons pass. The names are a reminder of those who've been here while their children were born and while their grandparents died. The pictures are a glimpse into the time they spent here. What did they think about? What were they focused on? That seems like quite a lot for a young artist, like Airman 1st Class White, to soak up and spit out onto a 6-by-6 piece of concrete. He was careful to represent the commander's vision and his flight's attitude in the design.

We'll shoot back to another visit to the flight by the commander and the operations officer on this particular day. The lieutenant colonel is checking on how the troops are doing, asking questions and passing on some information with an exclamation point. As always, he takes great pride in being able to get out with the troops, especially being able to call the Airmen to attention and order them to post, as we do at the beginning of every shift. Before he orders them to post, the lieutenant colonel shouts, "What are we?" "Wolves!" they shout back, nearly shaking the building. "And what do we do with the sheep?" he shouts. "Eat them!" a few Airmen shout back. Their master sergeant assures the commander, "I'll only let them eat a few, sir." With a grin, the lieutenant colonel reminds them that they are to protect the sheep. "In my world," he says, "the wolves protect the sheep."

Back at the barrier, Airman White spent countless hours of his off time to make the mural say exactly what it should say. He took the time to make sure his flight and his commander's vision were proudly represented. It's a mural that people tend to stop and look at when they pass. Most importantly, it's filled with the names of people who I'm proud of. I'm very proud to have served our great nation at their side and to have my name on our flight's mural with them. With the dedication, teamwork and conviction this mural embodies, I hope my fellow Airmen and warriors all return home safely. ✈️

WEAPONS



Be Trained for the Task at Hand

MASTER SGT. BRIAN MITCHELL,
U.S. Air Force, retired

There I was a young staff sergeant who had just arrived at Vandenberg AFB, Calif., from Edwards AFB, Calif. Originally, I was to be assigned to the munitions control section, but when I signed into the squadron, I was reassigned to the Peacekeeper ICBM shop. I imagine the reason for the move was the manning there was low. I was new to the base, so I didn't complain. Prior to this assignment, I worked from contractor documents the previous six years, not technical orders. I knew this was definitely going to be a change for me.

After I accomplished my training, I was finally able to be in the shop and see how operations worked. It took me a little while to get acclimated to this new environment, but I could tell that they really needed help. They had a team chief and team member to build re-entry vehicles and only one team chief to build the deployment module. Since they appeared to be undermanned, I figured I would try and help out the team in whatever way I could. I was new to the re-entry vehicle/re-entry system.

Most, if not all, of the general tasks in my career-field education and training plan were signed off. I was confident in my abilities to help the guys out, so the team chief for an RV assembly had asked me to run the hoist for an assembly. Back then, we really didn't have a bay chief. We had an assistant NCOIC who thought it

was OK for me to run the hoist. I ran the hoist with the forward section of an RV attached. A team member was giving me directions to bring the hoist down. I had the hoist in creep mode, when, all of the sudden, our bay door opened, and there stood our assistant NCOIC and quality assurance representative. The assistant NCOIC stormed out of the bay without stopping our operation and went right into the NCOIC office.

The team chief decided to hold off on the rest of the operation, so we stopped the task. We were all waiting in the bay to see what was going to happen. After about 15 minutes, our NCOIC came out in the bay and proceeded to give us a stern lecture. I tried to plead my case, saying I had been running hoists for years, and I really didn't see a big problem. Well, I was wrong. I was told by our master sergeant NCOIC that we do things right in this shop, and he wasn't going to tolerate it when people aren't properly trained for the task.

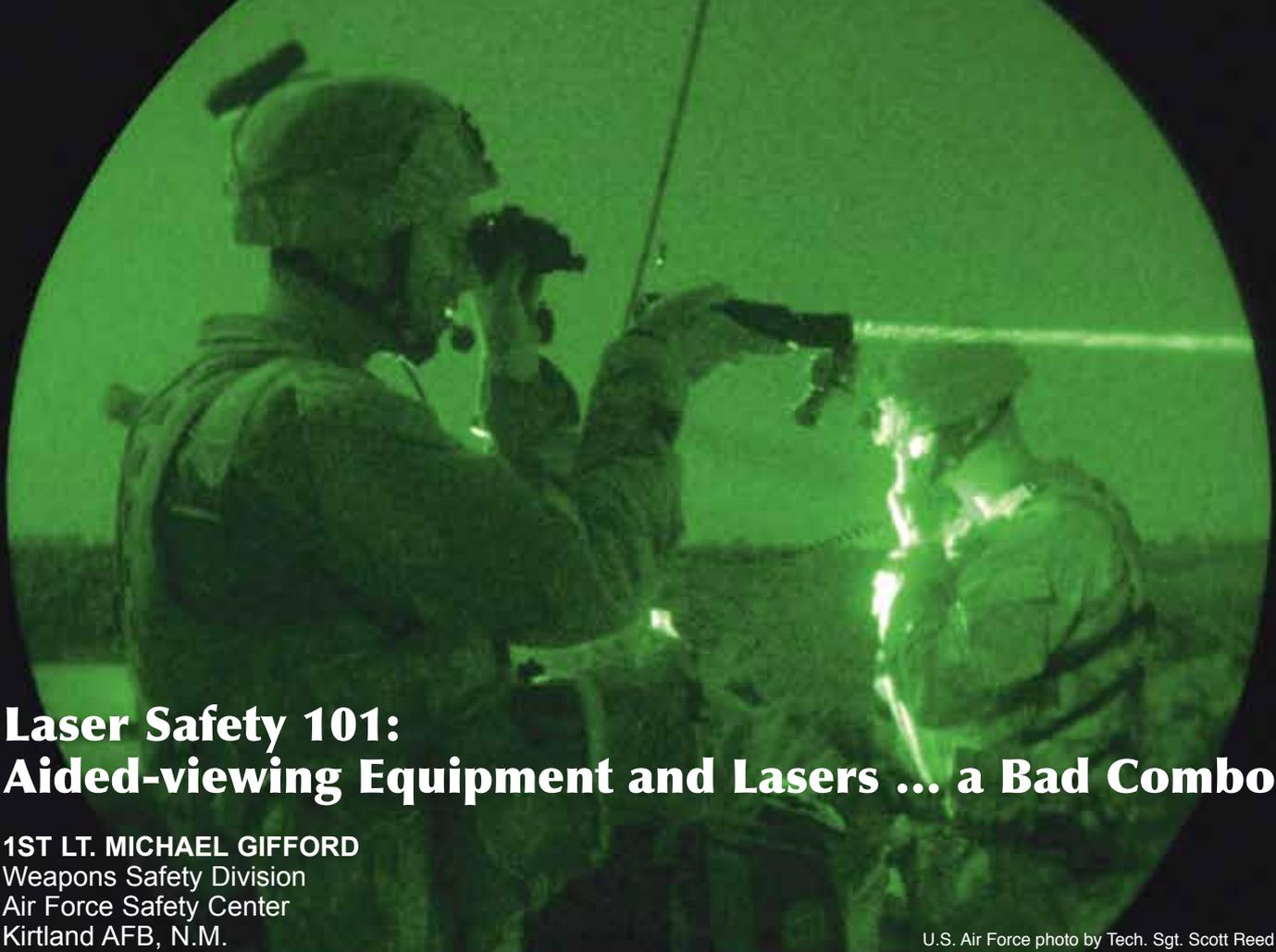
Like I said before, I really didn't see a problem, but you know that old saying "hindsight is 20/20." Now, retired after about 25 years in the service, I can say to all of the young team chiefs out there – never take anything for granted. You have a very important job that you do day in and day out. Just remember to take it one step at a time.

The moral to this story is if you're not signed off in your training records for a certain task, even though you've done the task before, you're not qualified, and your team could go down. Remember peace and safety is our profession. ☮

U.S. Air Force photo by Airman John Parie



WEAPONS



Laser Safety 101: Aided-viewing Equipment and Lasers ... a Bad Combo

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U.S. Air Force photo by Tech. Sgt. Scott Reed

The Air Force Safety Center has seen an increase in lasers needing approval for use in the field over the past few years. The technology has been around since the '60s and has really started to step up to the plate when it comes to designation, pointing, and warning applications. The broad spectrum encompasses aircraft-mounted, hand-held, or ground-vehicle-based laser systems. Lasers are no longer “weapons of the future.” The technology is here, being used and beneficial on so many levels.

We are talking about Directed Energy Devices and a few Directed Energy Weapons that limit collateral damage, evoke human response without killing and disrupt enemy operations on a whole new level. The current technology can reach out and touch the “bad guy” or enemy resource at the speed of light while remaining invisible. With awesome power comes awesome responsibility. These systems demand the utmost respect and safety precautions because some of them cannot be seen when operating. Make no mistake — they are doing their job, but some are designed to operate outside the visible spectrum humans can see.

Air Force organizations as well as all DoD components that use lasers get together and discuss laser issues twice a year or whenever a hot topic arises at the Laser System Safety Working Group. Leadership from every branch takes a proactive approach to protect those working with and around lasers. Bottom line: laser systems are out there, and any Airman can run into one during his or

her stint of service, not to mention everyday life because lasers are readily available for commercial purchase.

The Air Force can really capitalize on laser usage if we do it correctly. The Air Force Safety Center looks at every military-specific laser in the Air Force inventory (this excludes medical and industrial lasers). A military-specific laser is any laser procured for combat, combat training or classified in the interest of national security. When the assessment is conducted, the Air Force Research Laboratory, more specifically its Laser Optics Branch (AFRL/RHDO), located in San Antonio, provides analytical results on the hazards associated with a laser. They present a safety summary with calculated or observed values based on specifications and operation of the laser system. Within this safety summary, a close look is given to Nominal Ocular Hazard Distances. A laser is the eye’s worst enemy, and since we only get two, it behooves us to analyze ocular hazards. RHDO looks at direct-eye exposure, 7x50 binoculars and 12 cm telescopes or unaided and aided-viewing-hazard distances.

Although RHDO analyzes 7x50 b-nocs and 12 cm t-sopes, there are all kinds of equipment out there to enhance our vision in operations. In every case, aided-viewing equipment multiplies the hazard distance associated with a laser. Laser X has an unaided-viewing hazard of 50 meters. Laser X viewed with 7x50 b-nocs has a hazard distance of 200 meters. This is purely an



U.S. Air Force photo by Rick Goodfriend

example with fictitious numbers to stress the fact. In reality, each laser-system hazard distance for aided and unaided viewing varies because of the operational characteristics (wavelength, power, mode, etc.). Aided-viewing equipment varies as well. The material used has its own characteristics. Depending on the shape and type of material used, different results can occur when a laser transmits through the medium. Laser energy could penetrate different distances or allow different wavelengths through. Different parts of the eye are susceptible to different wavelengths. For example, the retina is more susceptible to radiation in the visible and near-infrared wavelengths (400-1400 nanometers). So, a laser that operates at 800 nanometers will penetrate the eye to inflict damage on the retina.

Binoculars, telescopes or any visual magnification device contains a lens of some sort. The lens can be manufactured or coated to meet operational needs. There are truly infinite possibilities out there, but what makes them so dangerous with respect to lasers? Light waves reflect, refract and transmit. These things occur all around us every day. An optical enhancement device has to transmit this light from the outer objective lens to the outer surface of the eyepiece lens which gets received by the observer's eye. The lens can be made from glass, plastic or even quartz crystal (Galileo's first telescope was made from quartz crystal). Lens coatings are another piece of the puzzle. Depending on

the shape or material of the lens, there may need to be some additional coating to enhance the transmission of light. These coatings can be metallic, multi-layered, phased, anti-reflective, or environment deterring. The lens and/or coating used on your equipment will affect laser-light transmission. We use these devices in the field to magnify our opposition. There is no single solution to account for all the variations when Airmen are conducting duties. Laser devices and aided-viewing equipment come in all shapes and sizes.

So how do we combat laser injury with two things that have so many variables? It's actually easy and simple. If you know a laser is operating in your AOR, DO NOT look for it with your binoculars. Another word of advice is to avoid looking at ANY laser with aided-viewing equipment. It is a sure fire way to injure yourself. It is worth noting that several aircraft in the Air Force inventory have lasers on board, and that number is increasing. We only get two eyes and they are incredibly sensitive when it comes to lasers. Rest assured that the Air Force puts time and money into assessing laser systems you come in contact with out there. Some of the responsibility falls on your shoulders, too. We need to know how to conduct ourselves around a laser system. Hopefully, this article takes some of the guesswork out of lasers and aided-viewing equipment, so when the time comes, you're ready for the fight! ☒

Saving Earth Orbit, One Piece of Junk at a Time



BRIAN WEEDEN
Secure World Foundation

U.S. Air Force photo by Senior Master Sgt. John Rohrer
Photo Illustration by Dan Harman

A decade ago, the notion of actively removing debris from Earth orbit (as opposed to natural atmospheric decay) was squarely in the science fiction category. Conventional wisdom labeled it as too expensive and too difficult to bother with, mainly because space was big and it would never get “too crowded.” It’s funny how events conspire to change our perception of things. In late June 2010, the Obama administration released the new U.S. National Space Policy which states:

“The now ubiquitous and interconnected nature of space capabilities and the world’s growing dependence on them mean that irresponsible acts in space can have

damaging consequences for all of us. For example, decades of space activity have littered Earth’s orbit with debris; and as the world’s space-faring nations continue to increase activities in space, the chance for a collision increases correspondingly.”¹

As with most human-created messes, a few very smart people saw this one coming. In the late 1970s, two influential NASA scientists, John Gabbard and Donald Kessler, laid the scientific groundwork for what became to be known as the “Kessler syndrome.” They predicted, at some point in the future, the population of human-generated space debris would hit a critical point where it

would pose a greater risk to spacecraft than the natural debris population of meteoroids. According to their models, large pieces of space debris would get hit by smaller pieces of debris, creating hundreds or thousands of new pieces of small debris which would then collide with other large pieces. This “collisional-cascading” process would increase the population of space debris at an exponential rate.

Although it would not become the bleak scenario shown in the movie *Wall-E*, the Kessler Syndrome meant that space debris would significantly increase the risks and costs of operating in space and could make certain missions no longer profitable or safe. At the time, the work of Kessler and Gabbard was seen as interesting. It was only one possible future and not predestined. The prevailing sentiment within the space community was that we wouldn’t let things get that bad, and there would be plenty of time to prevent the Kessler Syndrome.

The events of the last few years have shattered what remained of that naiveté. A series of intentional and unintentional events, including the 2007 Chinese anti-satellite (ASAT) test and the 2009 Iridium-Cosmos collision, have brought the harsh reality into focus: The Kessler Syndrome is real, it is happening, and if we haven’t hit the point of no return by now, we will soon. Although new spacecraft are being built and operated in a more responsible fashion, especially with regard to proper end-of-life disposal, there is a huge legacy burden of five decades of satellites and rocket bodies to deal with. Many of these rocket bodies have a tendency to explode years after they are placed in orbit. Massive satellites, such as ESA’s *Envisat*, were not designed to be de-orbited. And even maneuverable satellites like *Galaxy 15* can still fail unexpectedly and become a hazard.

At the 5th European Space Debris Conference in spring 2009, scientists and debris researchers concluded that simply reducing the amount of space debris we create, known as debris mitigation, is not going to solve the problem. There is enough existing debris that, even with no new launches, debris-on-debris collisions will continue to create more debris. The researchers concluded that active debris removal is necessary to ensure the long-term sustainability of Earth orbit, and that removing a few as five or ten of the most massive debris objects each year might be enough to stabilize the growth in debris population.

These conclusions prompted the Defense Advanced Research Projects Agency and NASA to jointly sponsor the first International Conference on Orbital Debris Removal, held in Virginia in December 2009. This was followed by a similar conference in Russia in April 2010 and another at the headquarters of the French National Space Agency (CNES) in Paris in June 2010. As an attendee at both the DARPA and CNES events, I can say that there were a lot of very interesting and promising techniques proposed for actively removing debris from

orbit. And there is a growing amount of interest from the private sector for it sees this as a potentially lucrative business enterprise.

However, much of the discussion about active debris removal so far has been about physics and engineering, and very little discussion has taken place with regard to the policy, legal and economic challenges. Usually these challenges are mentioned only in passing by the scientists and engineers. But these are extremely important aspects of orbital debris removal and could make or break the whole enterprise.

I was one of the few who did talk about the legal, policy, and economic issues at the DARPA conference. In my presentation, I highlighted a number of the most vexing non-technical issues:

- What is space debris, as legally separate from valuable space objects?
- Who decides which objects should be removed?
- Who is allowed to remove what objects?
- Who pays for the debris removal?
- What are the intellectual property rights and restrictions?
- Is that spacecraft headed towards my satellite an orbital debris removal vehicle or an anti-satellite weapon?

That last question is perhaps the most important. While active debris removal is not an anti-satellite or “space weapons” activity, some of the same technologies being considered for removing debris also have anti-satellite applications. Moreover, development of active-debris-removal technologies could be interpreted as an ASAT development program.

The new U.S. National Space Policy also states that “it is the shared interest of all nations to act responsibly in space to help prevent mishaps, misperceptions, and mistrust.”² Active debris removal is certainly an activity which, if done without proper communication, coordination and transparency could create mishaps, misperceptions and mistrust. And while the engineers and scientists have seized on the importance of this issue and are dutifully working on solutions, the same cannot be said of people in the policymaking and legal communities, many of whom still consider the concept of actively removing objects from orbit science fiction. Thus the question remains: When will the non-technical communities get engaged, and will the non-technical issues prove more challenging than the engineering and physics? ☞☞☞

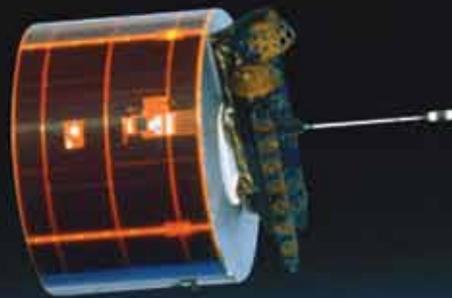
References:

¹White House, “U.S. National Space Policy,” June 28, 2010, online at http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf

²Ibid

Originally appeared Aug. 11, 2010 in Space News Blog, spacenews.com. Used with permission of author.

Using System Safety to Effectively Implement Air Force Orbital Safety Policy



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I. Introduction

Air Force Instruction 91-217, *Space Safety and Mishap Prevention Program*, states, "The high cost of orbital space systems, unique operational design and irrecoverable nature of orbital operations make mishap prevention a critical component of orbital space systems." For spacecraft, a mishap can also include permanent or temporary loss or degradation of mission capability or shortened life.

System safety deals with mishap prevention through design. As part of that process, orbital safety assessments should begin as early as possible in the program lifecycle when considerations of safety requirements can be incorporated into the design. The assessment of on-orbit hazards should cover risks to the spacecraft throughout its operational lifetime, to include disposal.

This should cover, at a minimum, the following areas:

- Collision avoidance. Appropriate action to minimize the risk of on-orbit collisions with other satellites or space debris.
- Directed energy. Programs or experiments using directed energy, either ground or space-based, should take appropriate action to minimize hazards or interference with spacecraft or the general public and property on the Earth's surface or in the atmosphere.
- Orbital debris minimization. Orbital systems should be designed to minimize the generation of orbital debris during and after their service life. At a minimum, establish routine state-of-health reports and have contingency plans prepared. This includes such areas as:

- Development of a formal end-of-life safing and disposal program for each spacecraft.
- Assessment of the potential permanent loss or degradation of any mission of a spacecraft, as defined by operational or test mission criteria, occurring during early orbit checkout/calibration.
- Assessment of all potential significant spacecraft malfunctions which will likely be declared a space mishap by the convening authority.
- Assessment of potential death, injury or illness of persons in space caused by an Air Force space system mishap or debris associated with that system.
- Space environment. Orbital systems should be designed to minimize damage due to natural phenomena such as meteoroids, solar radiation, spacecraft charging and high energy cosmic radiation, solar flares, etc.
- Ground-based errors. Ground-based errors should be considered. The assessment should include identification of the potential permanent loss or degradation of any mission of an individual satellite, as defined by operational or test mission criteria, as a result of ground-based errors caused by humans, software, training or management deficiencies.

II. Responsibilities and the System Safety Program

Each system program director needs to insure that DOD and Air Force policies are properly supported in contract requirements. AFI 91-202, *The US Air Force Mishap Prevention Program*, Chapter 9, establishes levels of responsibility for execution of the system safety process.



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Photo Illustration by Dan Harman

The program manager is responsible for implementing a System Safety Program. Elements of a good SSP include:

- Establishing and maintaining an appropriately tailored SSP according to DOD Military Standard System Safety Program Requirements or MIL-STD 882. (Note: For Space Acquisition Programs, MIL-STD-882C is used.)
- Identification and assessment of safety hazards and risks throughout the program life, to include acceptance of residual risks at the appropriate level of risk acceptance.
- Incorporation of system safety requirements and design criteria into other program requirements such as reliability, maintainability, and human factors.

The SSP is the method by which the SPD satisfies mishap prevention responsibilities throughout the spacecraft's life cycle.

III. Basic Principles and Lessons Learned in Using System Safety to Support Space Safety

While not a complete list, and in the interest of brevity for this article, the following principles are drawn from the experiences of the author and co-workers at the Space and Missile Systems Center:

A. Strong Acquisition Authority Oversight

The "Acquisition Reform" era of the mid-1990s included the contractor's ownership of total system performance responsibility, resulting in the contractor

making critical decisions regarding mishap risk without approval or input from the SPD. TSPR allowed contracts to be bid at lower cost (due to minimization of reporting requirements and lowered levels of risk acceptance); however, as these programs now transition to operations, there is uncertainty as to mishap risks and orbital safety requirements are not being met.

Strong contractual oversight is required to manage the SSP in accordance with orbital safety requirements. For that reason, Air Force Space Command endorses the use of MIL-STD 882C through its supplement to AFI 91-202.

B. Integration of Mishap Risk with the Program Risk Management Process

Mishap risk and program risk management processes are sometimes developed independently without a proper understanding of how these processes relate. Mishap risks have a direct impact to the traditional components of program risk (cost, schedule, and performance), and this lack of linkage can result in mishap risks being handled with less rigor and management involvement than traditional program risks, including inappropriate disposition. Satisfaction of orbital safety requirements requires integration of mishap risks within the program's risk-management process.

AFI 91-217, Chapter 2, states that the SPD must clearly define and document risk acceptance authority during life-cycle system decisions. SMC has developed SMCI 63-1205, *Space System Safety Policy, Process, and Techniques*, to further define Space mishap risk acceptance policy (Section A.6), and is derived from 882.

			Hazard Probability				
			Frequent	Probable	Occasional	Remote	Improbable
			A	B	C	D	E
Severity	Catastrophic	I					
	Critical	II					
	Marginal	III					
	Negligible	IV					
			Risk Levels				

Hazard Assessment Matrix

Severity Definition

- Catastrophic** Death or permanent total disability, system loss, major property damage, loss exceeding \$1M, or irreversible severe environmental damage that violates law or regulation.
- Critical** Permanent partial disability or temporary total disability in excess of three months, major system damage, significant property damage, loss exceeding \$200K, but less than \$1M or reversible environmental damage that violates law or regulation.
- Marginal** Minor injury, lost workday accident or compensable injury/illness, minor system or property damage, loss exceeding \$10K, but less than \$200K or mitigative environmental damage without violating law or regulation where restoration activities can be accomplished.
- Negligible** First aid or minor supportive medical treatment, minor system impairment. Could result in injury or illness not resulting in a lost workday, loss less than \$10K, minimal environmental damage not exceeding law or regulation.

Hazard Probability Definition

- Frequent** Likely to occur frequently in life of system, item, facility, etc. Continuously experienced in fleet/inventory. Probability of Occurrence: $(X) > 10^{-1}$
- Probable** Will occur several times in life of item. Will occur frequently in fleet/inventory. Probability of Occurrence: $10^{-1} > (X) > 10^{-2}$
- Occasional** Likely to occur sometime in life of item. Will occur several times in fleet/inventory. Probability of Occurrence: $10^{-2} > (X) > 10^{-3}$
- Remote** Unlikely but possible to occur in life of item. Unlikely, but can reasonably be expected to occur in fleet/inventory. Probability of Occurrence: $10^{-3} > (X) > 10^{-6}$
- Improbable** So unlikely it can be assumed occurrence may not be experienced. Unlikely to occur, but possible in fleet/inventory. Probability of occurrence: $10^{-6} > (X)$

Residual Hazard Risk Assessment Value	Hazard Risk Category	Hazard Risk Acceptance Level
IA, IB, IC, IIA, IIB	High	Milestone Decision Authority (PEO/MDA)
ID, IIC, IIIA, IIIB	Serious	Program Executive Officer (PEO)
IE, IID, IIE, IIIC, IIID, IIIE, IVA, IVB	Medium	Program Manager (PM)
IVC, IVD, IVE	Low	SSM/Chief Engineer Summary to PM

Risk Acceptance Authority

SMCI 63-1205, Space System Safety Policy, Process and Techniques, (Section A.6)

C. Establish a Safety Design Philosophy Driven by Safety Requirements

System Safety is a proactive, not reactive, process, and requires integration across many engineering specialties as early in the system lifecycle as possible.

For example, MIL-STD-882C, Appendix C, 70.1, considers designs that have single (or dual independent) component failures (which could cause a mishap of catastrophic or critical severity) to be unacceptable. This requirement assures safety-critical functions are

dual-fault tolerant, or that appropriate rationale (such as high reliability for critical components) be provided for approving any exceptions.

IV. Conclusion

System safety requires that everyone in the program understand and identify hazards throughout the program lifecycle. Proper understanding of how hazards can impact design decisions can be a powerful tool in insuring compliance with orbital safety requirements. ☛

Generation M

Diet Secrets – I’ve Got the Answer!

JAMES RYAN JARRELL

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I feel as if my generation is being led to believe that being skinny is “right.” A muscular man or a slender woman — turn on any mainstream media source and that’s what you get. It seems as if it wouldn’t be appropriate any other way — or maybe that’s just what some in society want us to think. In a generation raised by the television, we’re the subjects of its cultural implications. We need to realize that commercial advertisements are just selling something. Truth be told — healthy is beautiful; 5-foot-11-inch, 100-pound models aren’t necessarily natural or healthy.

Take a moment and consider the following:

- The United States is a society where as many as 10 million females and one million males are struggling for their lives with eating disorders such as anorexia, bulimia and binge eating.¹
- For females between 15 and 24 years old who suffer from anorexia nervosa, the mortality rate is 12 times higher than the death rate of ALL other causes of death.²
- Americans spend over \$40 billion on dieting and diet-related products each year.³
- More than one-half of teenage girls and nearly one-third of teenage boys use unhealthy, weight-control behaviors, such as skipping meals, fasting, smoking cigarettes, vomiting and taking laxatives.⁴
- Girls who frequently diet are 12 times as likely to binge as girls who don’t diet.⁴

Dieting is a practice that needs to be undertaken intelligently. Too often lies are told for monetary gains, preying on the weak and exploiting the participants through unhealthy cultural implications, which can often

lead to life-threatening obsessions. The way to truly lose weight and keep it off is through a healthy lifestyle — making daily choices that positively affect you and then turning those choices into a way of living. Sadly, there is no simple or fast way to lose weight and keep it off. Ask yourself, why is it that these new diet trends seem to always disappear from the radar so quickly? It’s really quite simple, they don’t work.

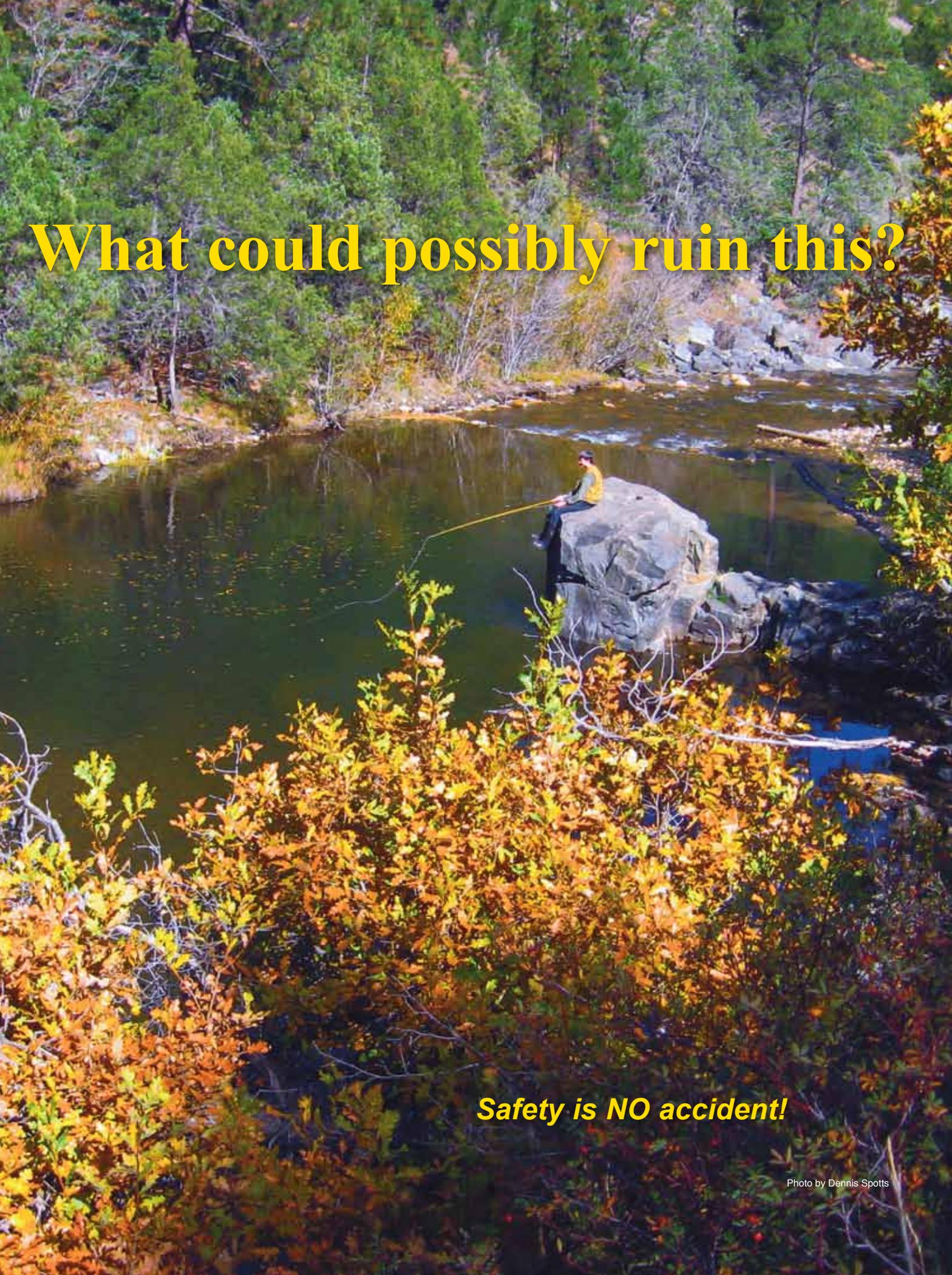
Positive health management is the ideal practice. Counting calories or measuring servings alone can often wear you down and lead to greater health problems if done incorrectly. The real secret is using common sense concerning your eating choices and the amount of food you ingest. If it seems unhealthy, odds are that it is. Try different types of foods. Enjoy whole foods, fruits, vegetables and lean meats. Drink water as a substitute for sugary beverages and try to avoid sugary desserts. If you must indulge, think more is less. Too much of anything is bad for you. If you need help determining caloric intake, consult a professional. Your doctor can make sure that the amount of food you are ingesting is correct, and from there your job is to monitor it.

The next step is also very simple — exercise. The secret to this is finding activities you enjoy and changing them when they become mundane. Many good things can come from a routine of healthy living. I believe THE REAL ANSWER for healthy living, which is true for many things in life, is educating yourself. 🏋️‍♀️

References:

- ¹ National Eating Disorders Association, www.NationalEatingDisorders.org
- ² L. Smolak, “Next Door Neighbors Puppet Guide Book,” National Eating Disorders Association, 1996
- ³ P. Sullivan, “Mortality in Anorexia Nervosa,” *American Journal of Psychiatry*, 152 (7), 1073-1074, 1995
- ⁴ D. Neumark-Sztainer, “I’m, Like, SO Fat!”, New York: The Guilford Press., pp. 5, 2005

Liquid Library Images

A scenic photograph of a river flowing through a dense forest. In the center, a person wearing a yellow jacket and a hat is perched on a large, grey rock in the middle of the river, fishing with a long rod. The water is dark and reflects the surrounding greenery. The foreground is filled with vibrant autumn foliage in shades of yellow and orange. The background shows a steep, rocky bank covered in lush green trees.

What could possibly ruin this?

Safety is NO accident!

Photo by Dennis Spotts