Volume 4, Number 2 Spring 2011

WINGMAN

Airmen Taking Care Of Airmen

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

Do Riders Make Better Drivers?

Remotely Piloted Aircraft

The Air Force Nuclear Certification Program

Great Expectations

Improving Orbital Safety

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

AVIATION YEAR IN REVIEW

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Spring Forward vs Spring Spike

U.S. Air Force photo by Dennis Spotts

MAJ. GEN. GREG FEEST
Air Force Chief of Safety and
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As I sit here in wintry weather conditions in DC — snow, cold, wind — I turn my thoughts to our Air Force Safety Center team in New Mexico — who are enjoying sunny, warm temperatures — to get into a "spring" frame of mind. After a winter like many have just experienced, we are digging out from snow and raring to "spring forward." We want to spring forward into sunshine … warm outdoor activities and sports without heavy coats and jackets.

Well, in the safety world, spring brings an increase in mishaps — the proverbial "Spring Spike." This year, we do not have to accept this "norm." Together, we can set a new norm.

We've already started on this path. Our aircraft mishaps continue at record lows and we are working hard to reduce ground mishaps. We just had our second consecutive year of zero Airmen fatalities from private motor vehicle mishaps between Christmas and New Year's Day.

The National Safety Council just recognized the Air Force for our efforts to reduce fatalities in young drivers. We selected 11 outstanding Airmen to sit on our 2nd Annual Air Force Safety Airman-to-Airman Safety Advisory Council, established to eliminate mishaps in the 17-26 year group, and are also actively engaged in social media with our Facebook, Twitter and YouTube pages. Our award-winning Wingman magazine just received five FY10 marketing and communications awards. The list goes on…and on…and on… .

In this issue, the safety enlisted career field manager's article gives you motivation to reflect on your leadership style. There is no doubt our recent successes are due to smart Airmen using risk management techniques promoted by our leaders as they continue to emphasize safety.

We have also included ground mishap prevention articles on private motor vehicle safety — motorcycles and cars — that should increase your vigilance as you travel the roads this spring. Other articles discuss the after-effects of mishaps: the toll they take on survivors, family members, friends and co-workers.

Our aviation articles focus on the "FY10 Year-In-Review." These articles cover maintenance issues, mishap stats and other items of interest covering our aircraft, manned and unmanned.

There are space articles on improving orbital safety through data sharing and ways for safety professionals to help institute positive change. We have included a discussion on why space weather matters to the safety community.

Finally, our weapons articles focus on Joint Test Assembly (JTA) management used to ensure hazard classifications are in compliance with established explosive safety standards. We also take a look at the first of a series of articles outlining the nuclear certification process.

Remember, spring doesn't have to bring an increase in mishaps. Effective this year, let's turn the "Spring Spike" into "Spring Forward." Now is the time to ask questions, get answers, provide suggestions and recommendations — all in a concerted effort to eliminate mishaps. With this new perspective, we will continue our Wingman mentality of looking out for each other. We will continue to involve family members in our efforts to eliminate mishaps when folks are outside the wire. In essence, we will "Spring Forward."

Are you in? ★★

The Enlisted Perspective

By CMSAF James A. Roy

Tuesday, October 26, 2010

Even one suicide is too many

An alarming trend is happening in our Air Force, and we need your help. We've had a drastic increase this year in the number of suicides among our total force Airmen - active duty, guard, reserve and civilians. Last year we lost 84 Airmen by suicides; this year, we've nearly reached that number, and it is only October. Even one suicide is too many!

We all take Suicide Awareness training, but that's just the first step - we must take immediate action and get involved. We need to look out for each other and understand that we're not alone. Be ready and willing to assist your Wingman and ask for help when you need it. We must all take the time to care about those around us. That's what good Wingmen do, and that's what our Air Force needs.

Supervisors at every level must act now. Get to know your Airmen better and understand their personal and professional challenges. This is not a time to sit idle and think this won't happen in your unit. No one is immune. Suicides range the spectrum of ages, locations, MAJCOMs and career fields. The two most common factors we've seen are problems with relationships and finances.

We need to be good Wingmen for others and also need to develop and maintain trusted relationships and friendships where we can talk openly and honestly about things happening in our own lives. We need to feel comfortable exchanging ideas, views and experiences with those who are closest to us. There is always someone available for you.

So many people care about you - more than you may think; family, friends, co-workers, supervisors, first sergeants, commanders, chaplains, medical professionals and senior leaders are ready and willing to listen and help. Just give them a chance. Don't ever think you are alone or that no one will understand. We will understand, and we will help you. It doesn't matter whether you write, call or e-mail, please reach out. We are an Air Force family and you mean a lot to all of us. If you feel you are at the end of your road, you are not - talk with someone. We care about you and will ensure you receive the help you need.

You should never be afraid of seeking help for fear of reprisal. Our lives should be the priority. The Air Force also has many resources to help. Military and family life consultants, chaplains and medical professionals are all available. Also, Military One Source counselors are always available by calling 800-342-9647 or visiting www.militaryonesource.com.

With everyone's help, we can and must step up and reverse this devastating trend.

JAMES A. ROY
Chief Master Sergeant
of the Air Force

From *Viewpoints*, www.af.mil

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

Tracking Motorcycle Riders is a MUSTT

The Motorcycle Unit Safety Tracking Tool (MUSTT) was first made available on April 1, 2010, and usage was voluntary. As a result of an update to AFI 91-207, the US Air Force Traffic Safety Program, the following personnel will be required to be tracked in MUSTT: military motorcycle riders who operate a motorcycle on- or off-duty, on or off the installation to include those riding off-road motorcycles; and DOD civilian motorcycle riders who operate a motorcycle on-duty, on or off an installation while in a duty status.

MUSTT is a management tool for tracking unit motorcycle riders, their training and fulfilling the commander's requirements outlined in AFI 91-207. Features of the tool include tracking unit riders, their motorcycles, training and required briefings. This one-stop tool allows management by MAJCOM and subordinate organizations. These organizations have instant access to rider populations and training needs. MUSTT is also capable of permanently filing training records for riders. This includes copies of their Motorcycle Safety Foundation (MSF) completion cards. This will be extremely valuable for those personnel who lose their cards and need a replacement.

Previously, a replacement card could only be obtained through the MSF instructor. Now, with a completion card on file, a motorcycle safety representative (MSR) can print out a copy for a rider. Since its initial rollout, over 12,000 military and civilian riders have been entered into the system.

If you need more information about MUSTT, or need to obtain rights as the MSR for your unit, contact your host installation safety office.

Brake for Bicycle Safety

JEREMY ROYER
482nd Fighter Wing
Homestead ARB, Fla.

Photo by Dennis Spotts

Most people learn to ride a bike at a young age. Because people feel as though they know how to ride a bike, bicycle safety is often forgotten or overlooked. Individuals often think that since they have been riding all their lives, nothing serious will happen when they go for a ride. That's what I used to think.

In the summer of 2004, some friends and I decided to go mountain biking in the foothills of Indiana. Even though I've ridden a bicycle since I was a kid, I wasn't experienced enough for the challenge that was ahead of me. The hills we were riding on were so large and steep that you had to pedal on the downhill just to make it up the next hill.

Luckily for me, my friends convinced me to wear a helmet, although I had never found it necessary in the past. As we navigated the trail, there were many obstacles such as trees, creeks and sharp corners. We came through a creek and the water came up over my bike tires. I had to get off and push the bike to the top of the next hill.

As I came down the next hill, which had a sharp right curve, I couldn't slow down enough to make the curve. I plowed into a huge pine tree and completely destroyed my bike. The handlebars were stripped and both tire rims were bent. A two-inch piece of my helmet was missing from the temple area. I couldn't remember where I was or how I got there.

My friends helped me carry the bike out of the woods and took me to the hospital. I was diagnosed with a mild concussion and retrograde amnesia.

That day I learned that bicycle safety is very important. My helmet saved my life, and I learned not to ride outside my experience level.

When you go out to enjoy a bike ride, make sure you wear a helmet and ride within your capabilities. It's also important to wear sunblock if you're riding during the day. If you're riding your bicycle at night, wear a reflective belt and have reflectors on your bike. It's a good idea to have a flashing light on your bike as well. Before riding, and especially while riding your bicycle, drink plenty of water to keep yourself hydrated. Below are several other bicycle safety tips that could help save your life:

- Always wear a helmet
- Obey all traffic controls
- Ride your bicycle near the right side of the road
- Never carry another person on your bicycle
- Always use hand signals when turning or stopping
- Look out for cars at cross streets, driveways and parking places
- Be careful when checking traffic and don't swerve when looking over your shoulder
- Give pedestrians the right-of-way
- Keep your bicycle in good condition
- Always ride carefully

Anyone can get hurt while riding a bicycle and no one is immune from bicycle accidents. Following these safety tips and using situational awareness will greatly reduce the likelihood of getting into an accident while riding your bicycle.

Driving Tired is a Deadly Choice

CAPT. CHRISTOPHER J. SLATTERY
44th Fighter Squadron
Kadena Air Base, Japan

Photo courtesy of author

Last summer, my stepmother, Susan, and my two brothers, Peter and Matthew, were on their way home from Ohio to Baltimore when, only an hour into their drive, they were rear-ended by a truck driver who had fallen asleep while driving. The impact pushed their car into a semi in front of them killing my stepmother and critically injuring Peter and Matthew. Following the impact with my family, the truck went on to hit two other semis and four more passenger vehicles before stopping in the divider and bursting into flames.

Matthew is still in a coma from massive head trauma and Peter is recovering from a broken pelvis and facial fracture. Peter was considered the "lucky" one. I disagree. Being conscious enough to overhear the paramedics pronounce your mom dead as they put you in a helicopter is not "luck," it's hell. At 11:44 a.m. on a beautifully clear day, my family's lives were changed forever!

In an instant, my father lost his wife and had two sons in emergency surgery, one of whom may never be the same. That was just the beginning of what would become our "new" life. The first weeks were spent juggling surgeries for both boys, meetings with doctors, lawyers and funeral directors, all while ensuring someone was at Peter and Matthew's side 24/7.

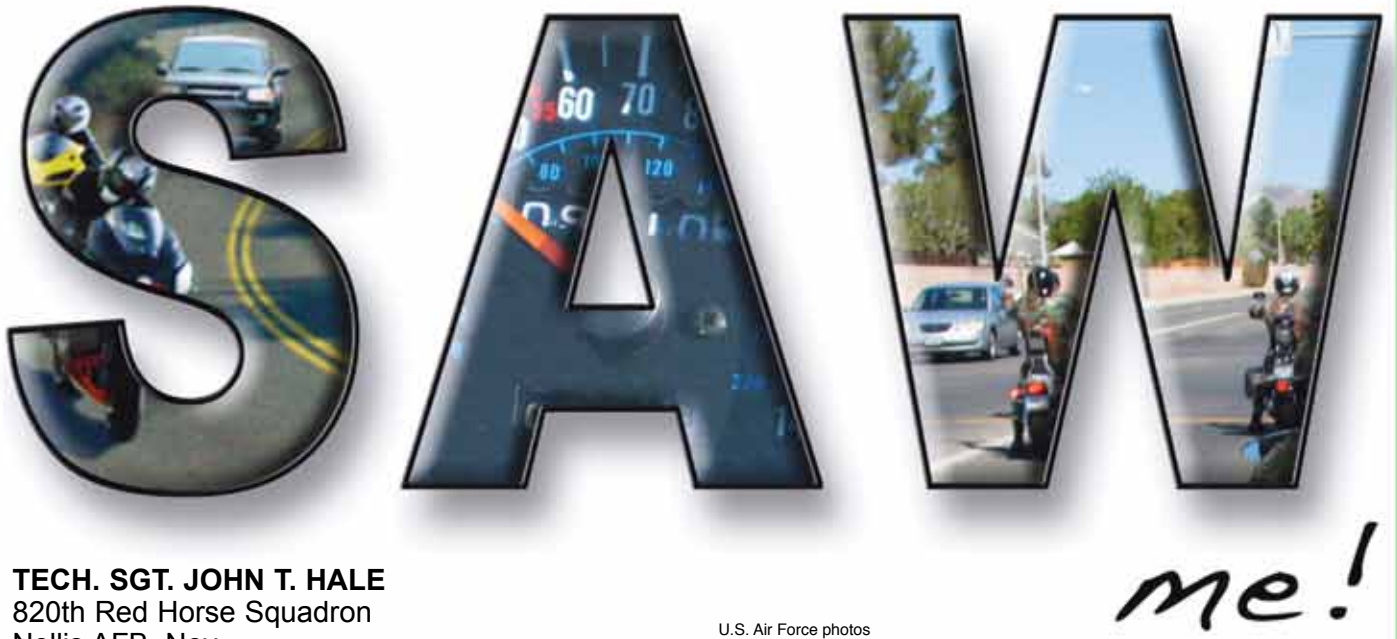
Time with Matthew was spent wondering if he was going to make it through the day. Every life support system imaginable was constantly alarming the intensive care unit team to a new danger that would spring them into action every couple of hours. Peter was alert, when not recovering from surgery, which was a challenge in itself. He felt every bit of the pain, physically and emotionally, and you could see it. Hospitals and funerals are what we associate with tragedy, but the long-term effects are seldom considered.

After a month in Ohio, the boys were finally stable enough to be transported back to Baltimore. Peter went home and Matthew went to a long-term care facility. My father divides his time between taking care of Peter at home and helping with Matthew's therapy at the care facility.

Taking care of his family makes working impossible. Life insurance and paid leave only get you so far when you're looking at years of rehabilitation. Peter will make a full recovery and has just gone back to full days at school. Matthew cannot talk and can only occasionally nod in response to yes or no questions. All of this happened because of one man who thought, "I'm not that tired."

An article sent out by the 18th Wing safety office at Kadena Air Base, Japan, stated that micro sleep lasting just three to four seconds is enough time for a vehicle to travel the length of a football field at 65 mph. Unfortunately, my family happened to be on that football field during those few seconds. Each of us signed up to ensure the safety and defense of our nation and families. That duty doesn't end when we leave work. What does it say about us if we hurt the very people we swore to defend by making poor choices off-duty? Please think twice before getting behind the wheel tired.

I'm glad the driver SAW me!



TECH. SGT. JOHN T. HALE
820th Red Horse Squadron
Nellis AFB, Nev.

U.S. Air Force photos
Photo Illustration by Dan Harman

I shouted, "What a knucklehead! You're going to get yourself killed!" as the motorcycle flew past me, weaving in and out of traffic. Another sport bike raced in pursuit, nearly smashing into the concrete wall and barely slipping down the off ramp.

Minutes later, out of congested traffic, I sighed with relief and noticed in my mirrors I was the only one on this stretch of highway. Half a minute later, without taking a second look, I changed lanes. Suddenly, a motorcycle dodged to the left out of my path; I was within inches of striking the bike. I failed to see the motorcycle that entered the highway and was passing me in the left lane. Now it was the motorcycle rider shouting, "What a knucklehead! You're going to get someone killed!"

Some motorcycle riders ignore traffic laws and put themselves in grave danger. Some automobile and truck drivers fail to notice motorcycles in traffic and put riders in grave danger. Drivers can do three things to share the road with fellow Airmen and neighbors riding motorcycles. Those three important safety tips can be found in the acronym "SAW."

The "S" in "SAW" stands for space. Give motorcycles space; they need extra room in traffic for evasive actions around cars, debris and potholes. The pieces of broken tire tread or the rut in the road might be just a bump to a driver but it can cause a rider to lose control of the motorcycle. The rider needs space for quick maneuvers around the hazard.

When a motorcycle is stopped at a red light, drivers need to make a slow approach and leave a car length of space. At the traffic light, with a car approaching from behind, consider how nerve-wracking it must be for the rider. He's thinking, "Does the driver see me stopped at the light? Will the driver give me space or am I going to get run over?"

The "A" in "SAW" is for ascertain speed and distance. As drivers, we're accustomed to judging cars and trucks moving in traffic and how far away they are. Motorcycles have a narrow silhouette and accelerate more quickly than cars. It can be challenging to determine their speed and distance. Advance your skills as a driver, practice observing motorcycles in traffic to determine their speed and distance. You'll be surprised as you realize how, with just a glance, you misjudge the location of motorcycles on the roadway. With this simple activity you'll become conscious of how quickly a motorcycle can accelerate and move through traffic compared to a car or truck.

Finally, the "W" in "SAW" stands for watch for bikes. You'll begin to be more aware of motorcycles on the roads. Drivers should watch for bikes by using their side and rearview mirrors and scanning the road. Before changing lanes activate your turn signal for several seconds, and just before you move, look over your shoulder. Take a second look before turning left across lanes of traffic. When pulling onto the road from a parking lot or side street, make sure to look carefully for your fellow Airmen and neighbors on their motorcycles. Share the road so the motorcycle rider can say, "I'm glad he 'SAW' me."

One Mistake Away

MAJ. LISA KARY
Nellis AFB, Nev.

U.S. Air Force photo by Dennis Spotts

I love motorcycles, sport bikes in particular. I'm attracted to the sense of freedom and adventure they provide. When I put on my riding gear to go for a spin, I can actually feel myself becoming more centered, more focused. My pulse picks up, just a little — probably from the adrenaline rush I get when I throw a leg over my R6. While I love to ride, I also have a very healthy respect for the power and speed of today's sport bikes — and I never take for granted that I could be one mistake away from breaking myself or my bike beyond repair.

There is an unfortunate "dark side" to sport bike riding. We've all seen them: the cocky young rider dicing through traffic at breakneck speeds; the daredevil riding a wheelie while going over 90 mph on the interstate; the would-be road racer trying to drag his knee in some twisty canyon. For those of you who think these are pretty cool tricks, I have a message: these people are attention-seeking idiots, and they're dangerous — not just to themselves, but also to those they share the road with. They also give a bad name to sport bikers everywhere.

I haven't been riding long, but I've learned a few things along the way. First, if you want to really open up that throttle and see what that baby can do, there's no better environment than the track to learn your limits. You reduce the risk to yourself and others by keeping it off the road. I can almost guarantee that your bike's limits will far exceed yours. If you need more convincing, how about avoiding that ticket for speeding or reckless driving and saving yourself some coin on your insurance? Better yet, how about saving your own neck?

A few years ago when getting ready for a race during the first practice of the morning on a cold track and more or less cold tires, I was rear-ended prior to the braking zone. While my bike flipped up and missed me, I landed in the middle of the track with about a dozen bikes bearing down on me. A trip to the emergency room showed a couple of broken ribs. I was lucky. When I went into work to fill out the ground safety paperwork the following Monday, my commander was shocked because I didn't have a mark on me. If I had been riding at 120 mph on the road, you wouldn't be reading this right now.

Even those of you who feel invincible and in complete control on the street, let me assure you that you're not. I've seen more than a few knee-dragging "canyon cruisers" getting their bikes hauled off on a trailer because they hit a patch of sand or a car spooked them going around a sharp bend. Even on a familiar road, there are just too many unknowns. The track provides relative predictability, on-site emergency responders,

U.S. Air Force photo

built-in safety features, run off areas and no speed limits.

Good-quality personal protective equipment (PPE) is invaluable, but only if you use it every time you ride. Helmets go without saying, but what about the rest of your riding ensemble? While jeans and a long-sleeved shirt are better than shorts and flip-flops, they'll offer you almost no protection from road rash in the event of a mishap.

Perforated leather racing suits have hundreds of tiny holes in them which allow air to penetrate and cool your skin. Aerostitch suits offer great abrasion protection, and you can wear street clothes underneath. If you opt for a two-piece riding suit, look for something that zips together all the way around. Otherwise, the suit won't offer much protection if you end up sliding across your back and it rides up. I know this stuff is expensive, but can you afford not to wear it? Broken bones eventually heal, but skin grafts are forever. Riding gloves with a forearm gauntlet and Kevlar-reinforced, mid-shin-length riding boots should be in your closet too. Good equipment is worth the investment.

The last point is that there is no substitute for experience and training. No matter how frequently or how long you've been riding, there's always room for improvement. Everyone on active duty who rides has training available. Track days allow you to learn more about your bike and your limits, but there are also great riding schools that teach bike-handling skills and techniques. Learning what it feels like to have a bike sliding underneath you will increase confidence.

I hope I've provided a little food for thought. Safety statistics don't affect us as much as they're intended to, primarily because we don't think we'll be the next statistic. If the numbers and the statistics don't affect your decisions before and during your ride, listen to the professionals, the racers who do this for a living.

Sport bikes are designed to go fast — on a race track. In the flying world, crew members are taught to "dress for egress," meaning if it's cold outside, wear your jacket in the cockpit and keep it cool inside; you never know when you might have a problem and have to bail out of that aircraft. The same goes for motorcycles — dress as if you're going to hit the pavement at 60 mph because you never know when it could happen.

Finally, keep learning and keep challenging yourself. Take a skills class every few years or try adding a new skill like dirt riding. You'll be surprised how quickly your confidence and riding skills will improve and you'll be better equipped to handle a situation that demands a quick and correct response. Your family and your Air Force family will be far happier if you don't become one of those statistics in the safety briefings.

U.S. Air Force photo by:
Airman 1st Class James Bell

Do Riders Make Better Drivers?

BRIAN K. SAPP
27th Special Operations Wing
Cannon AFB, N.M.

It has long been a theory of mine that motorcycle riders make better automobile drivers. I think as motorcyclists gain the knowledge for what keeps them safe on bikes, they tend to use that same information while driving automobiles. Why do I bring this up? Let me set the scenario for you.

One afternoon I was riding my motorcycle out the base gate and following a little red car onto the highway. As the driver of the car and I traveled eastbound on the highway and approached my turn off, we both must have seen the same thing — eastbound cars exiting onto an adjoining freeway as well as other cars coming off the freeway and merging onto the highway's eastbound right lane.

The driver of the red car and I both took all of this into account and appropriately turned on our left turn signals and moved to the left lane as we approached the intersection. I didn't give much thought to the SUV that was heading westbound on the highway and entering the left-turn lane to cross the eastbound lanes in front of us and head south, other than to just mentally note that it was there. There were cars everywhere at the intersection. The thought of the SUV's driver just whipping right across the eastbound lanes without slowing or even looking to see if there were any eastbound vehicles didn't even cross my mind. But that's exactly what the driver did and pulled right in front of the little red car I was following.

The red car immediately braked, made a defensive swerve and somehow managed to avoid a head-on collision at 55 mph. I still haven't figured out how he missed the front of the SUV. The SUV caught him in the driver-side-rear door and rear fender, leaving a nice impression of the SUV bumper down the back half of the car. The car bumped over a little, came back to the inside lane and slowed down as the SUV continued across the intersection and stopped. As all of this happened right in front of me, all I could do was react by braking hard (yep, I locked 'em up), downshifting, swerving and trying to miss the red car and the SUV as I passed between them.

I managed to pull over on the right shoulder of the highway. The car pulled over to the shoulder behind me. I was pretty shaken up so I let the driver check on the occupants in the SUV.

As I stood there trying to lower my adrenaline level, the driver of the red car came back and said the two occupants in the SUV were OK but the front end of their vehicle was busted up. We started talking about what had happened as we waited for the sheriff to arrive and take our statements.

The driver of the red car was an active-duty Airman who also happened to be a motorcycle rider. He said that he'd seen me behind him as we left the base and knew I was still back there. As the accident happened, the only thing he could think about was, "Where is the bike?" He consciously thought about that as his rider/driver skills took over subconsciously and did the driving for him.

Why is this so important to me? His motorcycle instincts are what made him swerve back to the inside lane giving me an escape route. Sounds simple, right? He was doing what he always does on a bike by taking into account not only what's in front of him, but also what's next to and behind him. If he had gone left, I would've plowed right into him and been in a world of hurt.

As you drive — or ride, maintain your awareness of what's going on around you, not just what's in front of you. When I give motorcycle safety briefings, I tell riders to expect every vehicle to pull out in front of them. That afternoon I wasn't practicing what I preach. I saw the SUV but didn't give it much thought. I'm glad the driver in the red car did!

To my fellow rider driving the little red car, I can't thank you enough. My hands stopped shaking about three hours after the accident. I'm glad no one was hurt and we were all able to drive away, although I'm not sure how far the SUV got with a busted radiator. Thanks for thinking of me on the bike, and I hope all is well with your car. Let me know the next time you're up for a ride, I'll ride with you anytime!

Keep the shiny side up!

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

U.S. Air Force photo by Airman 1st Class Matthew Flynn
Photo Illustration by Dan Harman

Swift Water

Airmen 1, 2 and 3 (A1, A2, A3) went on a 15-mile canoe trip on a river in the Northwest. A1, A2 and A2's Labrador retriever were in one canoe and A3 was in another with food and supplies. Nearly 14 miles into the trip, the canoe that A1, A2 and the dog were in got caught in some underwater tree limbs and overturned, dumping everyone into the river. A2 and the dog were able to grab some nearby branches and hold on, but A1was unable to grab a limb and disappeared under the water. A3 was about 100 yards behind when the canoe overturned and immediately went to the aid of A2 and the dog. They all then went downstream to locate and rescue A1. A1's body resurfaced about two miles downriver and resuscitation efforts were unsuccessful. Alcohol and fatigue were not factors.

Lessons Learned

The Airmen failed to follow sound risk management principles while preparing for and during the trip. The canoe A1 and A2 were in was designed for use in lakes, ponds or still water, not in a river where the current ran between 10 and 17

knots. Even though local laws required the use of life jackets, and the group brought them, no one was wearing a life jacket. All failed to be good Wingmen to each other by not insisting life jackets be worn. When engaging in any activity, select the right equipment and use it the right way. Even very strong swimmers would have trouble in waters running as fast as the river in the mishap. It was fortunate for A2 and the dog that they fell where they could grab tree limbs, and that someone else was there to come to their aid. When participating in water sports, use a life jacket. It's too late to think about wearing a life jacket once you hit the water.

U.S. Air Force photo by Dennis Spotts

Ninety to Nothing

On a cool April afternoon, Airman 1 (A1) was riding a Yamaha sport bike on a four-lane undivided highway. A1 was going 90 mph even though the speed limit was 40. As the bike approached a yellow-flashing-light-controlled intersection, a car pulled up to the intersection from the right. The driver of the car stopped and looked both ways before crossing into A1's path while making a left turn. A1 struck the car so hard that the collision turned the car completely around. The impact caused the bike's speedometer to become embedded in the side of the car. A1 died from the impact. Alcohol and fatigue were not factors.

Lessons Learned

A1 used good risk management in some respects, while ignoring it in other ways. A1 was wearing all the appropriate personal protective equipment (PPE), including a full-face helmet, gloves and a Kevlar riding suit. However, going 90 mph in a 40 mph zone negates the usefulness of the PPE. While it's true that the other driver pulled into A1's path, there's no way that a driver could anticipate that A1 would be approaching at more than twice the posted speed limit. Human beings are predisposed to look at things in a single context. This is why it's hard for us to judge the speed of vehicles that we don't drive regularly. The speed of large trucks, trains and motorcycles is hard for many drivers to judge. On a motorcycle at a distance, the only thing that appears to another driver is the headlight, which gives very little information to help someone judge your speed. Newer bikes have two side-by-side headlights that may look like a car that's even further away. Don't fool yourself into believing that PPE can save you in a high-speed crash. Ride within the speed limits, be seen and watch out for the other guy.

U.S. Air Force photo by Staff Sgt. Joshua Garcia

Ski-worthy

On a warm, spring day, Airmen 1, 2 and 3 (A1, A2, A3) decided to rent some Jet Skis at the lake. A1 and A2 were on one Jet Ski, and A3 was on the other. After riding together for a while, A3 made a U-turn and sped off in the other direction. When A1 and A2 realized that A3 had changed direction, A2 turned the Jet Ski and gave it full throttle to catch up. A3 made a left turn just as A1 and A2 pulled up rapidly on the left. A2 was unable to avoid A3, and A1's leg was trapped between the two Jet Skis when they collided. A1 was taken to the local hospital and diagnosed with a broken lower leg. Alcohol and fatigue were not factors.

Lessons Learned

Poor use of risk management principles led to the mishap and A1's leg injury. All three participants were inexperienced Jet Ski riders. When given a short training course and test by the rental agency, the Airmen didn't take them seriously, and by their own admission, didn't pay attention. Overestimating our capabilities often leads us into difficult situations. When given a chance to learn information about an activity we're not familiar

with, it's important to pay attention and learn about the hazards and how to mitigate them. A1, A2 and A3 were lucky that their disregard for the dangers only resulted in one broken leg and not one or more lost lives.

U.S. Air Force photo by Senior Master Sgt. David H. Lipp

Zip It!

While walking through a local park, four Airmen (A1, A2, A3 and A4) saw what looked to be a zip line over the river. After a little thought and a lot of discussion they decided A1 would be the first to "ride the line." A1 went to a local second-hand sporting goods store and purchased a lat pull-down bar and two hooks designed to connect the bar to weightlifting equipment. The next Saturday, the four Airmen returned to the park to ride the zip line across the river. A1 crossed the river and climbed 40 feet up the tree to the zip line platform. A1 connected the lat pull-down bar to the zip line with the two hooks. When A1 stepped off the platform, one of the two hooks failed and A1 fell 40 feet to the ground, fracturing his left clavicle and right wrist. Alcohol and fatigue were not factors.

Lessons Learned

Risk management was not used and seemingly not even thought of in this mishap. None of the Airmen had any experience riding zip lines. By deciding to buy used weightlifting equipment instead of locating the appropriate equipment, A1 almost ensured that something bad was going to happen. There are several hazards involved in zip lining. Even if A1 had gotten farther off the platform, without a harness it was doubtful that his grip would have lasted the length of the ride. With no experience or instruction, even if A1 had made it to the other end, a good landing was far from a sure thing. A1 was lucky that a 40-foot fall didn't have more serious consequences than a few broken bones. Paralysis and even death were possible outcomes of this ill-advised trip. A2, A3 and A4 made one good decision on this day. After seeing A1 fall, they chose not to "ride the line."

Epilogue

Several factors are consistent within all the previous mishaps. Notably, alcohol and fatigue were not factors. While the use of alcohol and fatigue can increase the chances of having a mishap, they're not required elements. Every preceding mishap includes either faulty risk management decision-making or a complete disregard for the risk management process. Very few of us purposely choose to hurt ourselves, so when you decide to participate in an activity, think about the possible outcomes. Choose the right equipment for the activity and if you don't have experience, get some instruction. These mishaps could have been prevented had the participants recognized the hazards and used good risk management thinking to prevent those hazards from creating the bad endings that ultimately occurred.

The Other Fatalities

U.S. Air Force photo by Master Sgt. Michael Featherston

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Safety personnel often talk about the loss of a military member's life due to a motor vehicle mishap. They talk about the impact on the immediate military family or surviving relatives. They also discuss the impact on the larger Air Force picture — the workplace, squadron, group or wing.

Statistically, mishaps and fatalities of our military members tend to be the result of single-vehicle mishaps. That doesn't mean simply one death, it means only one vehicle. What doesn't get a lot of ink is the collateral damage of mishaps that involve our warfighters. There may have been multiple deaths. Collateral damage is an interesting, yet very benign, term. It's a harmless set of words that seem to defer responsibility — a "we didn't mean to do it" sort of thing.

The safety community doesn't formally track the associated deaths when our personnel are part of a fatal car or motorcycle crash involving others who aren't members of the service. These deaths are sometimes mentioned as passing information in a mishap report or the local press. Sometimes, if the military member was at fault and wasn't killed in the mishap, this information might be part of civil legal proceedings.

It's bad enough when a military member makes a choice to drive or behave in an endangering manner; when they act this way without regard to the consequences to the larger community, that's sad. There are military members who are dead, in jail or prison and those awaiting trial because of their behaviors and the results of their decisions.

So who are these ghosts that are so casually dismissed in narratives recounting the mishap? Does someone in uniform show up for their funerals? These might be people known to the military member driving the car. Their passengers might be friends from high school, the date for the night, a long-term partner and their shared children. As for the other drivers on the road, they're about to become the victim of someone going too fast, having had one too many or simply pushing the throttle because they get a kick out of going fast. In these vehicles are grandparents, parents, sons and daughters, babies or a guy going home from work. These are the nameless — strangers with the misfortune of simply being in the wrong place.

What's the point? Most everything regarding the decisions made behind the wheel or twisting the throttle are in the hands of the person in control of the vehicle. That behavior is developed and cultivated by experience and other environmental or cultural influences. Safety personnel can educate, inform and hope their efforts translate to influencing behavior, adjusting attitudes and bending a person's approach to get them to be safe as they go through life.

Perhaps this has touched you on some level to reconsider what you do behind the wheel. No one will take better care of you than you; and if you take care of yourself, you'll be taking care of others.

BA Bird/Wildlife Airc

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Available FY10 Bird/Wildlife Aircraft Strike Hazard (BASH) data indicates no significant change in BASH statistics for the third consecutive year, and recent years have been relatively good.

Due to the ***Wingman*** magazine's deadline, this article must go forward without all AFSAS reports being closed out for FY10. These numbers may change slightly, but based on what we have now, we can only hope this trend continues! Total strikes reported for FY08 were 4,819, FY09 saw 4,470 and 4,441 strikes in FY10.

Although these strike statistics may show a slight decline, without having an accurate estimate of how many hours are actually spent operating in the bird-rich altitude below 2,000 feet, such a small average reduction between the years does not support a high degree of significance.

Had it not been for one very expensive (more than $10 million) F-15E Class A mishap on a low-level training route, the total cost of BASH mishaps for FY10 would have closely reflected (approximately a one percent variation) the total cost for the years previously referenced.

Reported mishap costs for FY08 were $11,042,236, $13,084,126 in FY09 and $21,435,548 in FY10. At the time of this summary, the one FY10 Class A mishap investigation remains open, but it appears that the damage amount will hold; thankfully both aircrew and aircraft were recovered safely.

The bird responsible in this year's Class A mishap was identified by the Smithsonian's Feather Identification Laboratory in Washington, D.C., as a black vulture, coincidently, the same species responsible for last year's lone Class A mishap.

There were two Class B mishaps in FY10, down from previous counts of 16 in FY09 and 12 in FY08. The Class B category showed the greatest decrease in numbers of wildlife struck and dollar damage across all mishap categories.

SH raft Strike Hazard

U.S. Air Force photo by Master Sgt. Michael Featherston
Photo Illustration by Dan Harman

Of the two strikes in this category, one involved a C-130H during a low-level training mission when it struck a flock of white-faced ibis, a mid-sized species of wading birds. The second strike happened on takeoff when a C-5 launched within 40 minutes of sunset and struck some storks, a very large species.

The Avian Hazard Advisory System (AHAS) was checked and accurately predicted a moderate bird watch condition for the Class A mishap and the C-130H Class B mishap — both occurred during low-level flight operations.

The second Class B mishap involving the C-5 happened during a launch within a known period of elevated bird activity, but no AHAS was available for that particular base.

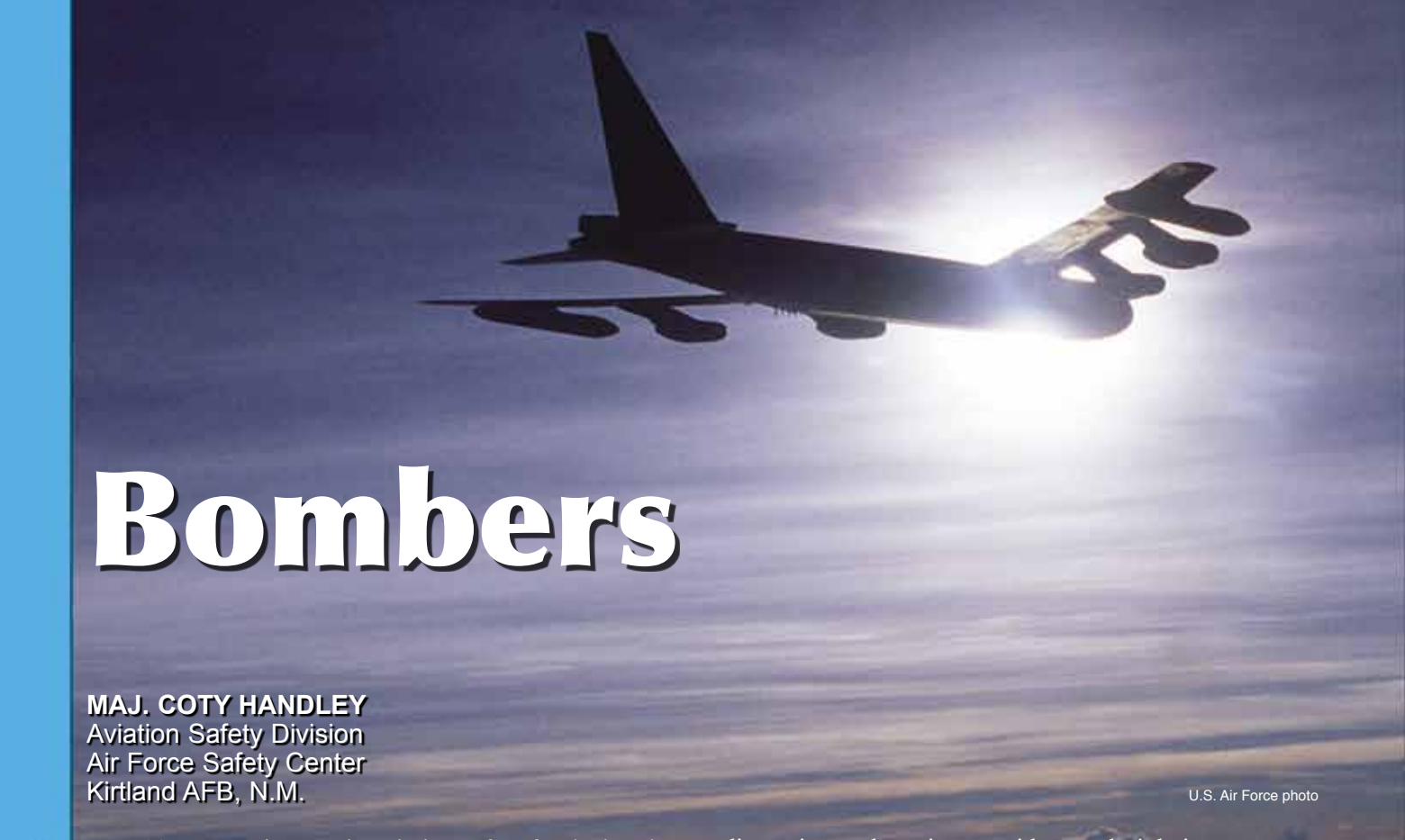
Although a required operational mission, the takeaway for this mishap was that it occurred on the airfield and may have been prevented by simply calling for a bird sweep of the area prior to aircraft launch.

To no surprise, the largest data set of strikes is the Class E mishap category. Although not considered a rate producer for most purposes, this body of data is useful to the BASH program in that it's used to monitor trend information and provides "chum" to AHAS.

Class E strikes for FY10 only increased by 23 strikes from FY09 and by 316 in FY08. Although damage costs did increase, they remained only slightly above a one percent increase above the two previous years' total damage cost.

The Air Force Safety Center's BASH team continues to look for ways to reduce hazards from wildlife and will pursue work on emerging technologies, such as bird detection radars and a support agreement with the USDA, to provide professional wildlife biologist support to installations.

Through these efforts, Airmen will always play an important role in keeping our flying mission safe from wildlife hazards.



Bombers

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U.S. Air Force photo

FY10 was a quiet year in aviation safety for the bomber community. Safety leaders at all levels met the challenge of upping FY09's ante. While FY10 aviation safety mishaps don't stand out in bomber history (and that's a good thing), a quick look at the year in review does provide the opportunity to reflect on ways to improve as well as which mitigation efforts really paid off.

Notable mishaps

The bomber community experienced only one Class A aviation mishap in FY10 and zero aviation fatalities. Unfortunately, when a $2.2 billion B-2 catches fire during engine start, it can easily meet the Class A cost threshold — or in this case, meet the threshold by a factor of approximately 32. Additionally, there were five B-1B Class B mishaps last year, mostly involving compressor stalls. With mishap numbers like those, bombers have a lot to be proud of safety-wise. Noteworthy, the B-52 fleet experienced zero Class A or B aviation mishaps for the year.

Human Factors

AFSAS revealed a variety of human factors (HF) in relation to bomber mishaps in FY10. Air Force-wide, the most notable HF observation is that people "fail" more often than equipment.

This trend will continue into the future as system reliability increases. All flight communities should consider how to adjust risk mitigation tactics with this fact in mind. FY10 bomber mishaps showcased errors in judgment, checklist errors, misperceptions, channelized attention, rushed actions, errors in risk assessment, distraction and routine or widespread violations to name just a few.

These errors occurred on both personal as well as organizational levels and are representative of HF errors for the Air Force overall. However, if humans have transitioned to the most susceptible link in the mishap chain, they also have the potential to be the strongest. Human vulnerabilities will continue to play a big role in how we fly, fight and win — so plan for it.

Trends

The largest trend area for bombers occurred in the Class C aircraft ground operations (AGO) category. Approximately 23 percent of Class C mishaps involved personnel injuring themselves by falling from or otherwise striking themselves on some part of an aircraft. B-1B engine compressor stalls and dropped objects were two other noticeable trend areas to prepare for in FY11, if one can call a handful of cases a "trend." While not earthshaking in magnitude, these areas represent considerable opportunity to increase mission effectiveness. You can't bring the pain if you're weighed down by trivialities such as these.

Focus Areas

Mishap prevention focus areas should include the continuation of good risk management decisions. Weigh decisions carefully and factor in room for error — think about how the mishap report will read if things go poorly. The times you will be viewed as a hero for taking an unnecessary risk are few and far between, if they exist at all. Fly frosty.

C-130

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U.S. Air Force photo by Staff Sgt. Elizabeth Rissmiller

FY10 marked another busy-but-safe year for the mighty Herk. Thankfully, we enjoyed zero fatalities or loss of aircraft. Given the mission-hacking pace of our fleet these days, this was a super effort. Your vigilance helped to make FY10 the Air Force's safest flying year ever.

Air Force-wide, this year's flight mishap rate was .70 as compared to last year's .90. Eight aircraft were lost this year, the same number as in FY09, compared to 15 in FY08. However, this year we suffered nine aviation fatalities, compared to six in FY09 and 13 in FY08. Class A flight mishaps totaled 14 this year, compared to 17 in FY09 and 13 in FY08.

In FY10 the C-130 community sustained one Class A aviation ground operations (AGO) mishap, three Class B mishaps and two Class B AGO mishaps. Special operations birds suffered the preponderance of damage in these two classes.

The sole Class A mishap (AGO) occurred when an MC-130P departed chocks during an engine run in icy conditions. A large ice pile stood ready to stop the aircraft but caused $2.4 million in damage. This mishap could have easily resulted in many fatalities (considering a prop was dislodged), but fortunately there was only one minor injury. The major lesson to take away is to never be afraid to sound your inner voice of concern, especially if it asks, "If we run up the engines on the ice, is it possible we might become a toboggan?"

The first Class B mishap involved birds versus an MC-130H during a low-level route. Ultimately the birds lost, but they took a chunk of a pricey aircraft sensor. The next mishap involved another pricey item, an MC-130P fuel drogue assembly, which separated during an air refueling mission. The third Class B mishap was sustained by an EC-130J that experienced damage to a prop gear box due to foreign object damage (FOD) — paint brush bristles in the oil system. Lastly, an MC-130E sustained a fuel vent blockage by FOD resulting in an over pressurization of the fuel tank and damage to the wing.

My fellow crewdogs, how many times can we trip on a roller, fall out an exit or allow a pallet to run us over? This year's Class C mishaps totaled 108. Of those, 46 were injuries in and around the Herk — that's 44 percent! The majority of the injuries were sustained by crewmembers and were a result of inattention or channelized attention. The other 56 percent were a result of jumper injuries, FOD and bird strikes.

Beyond the numbers, what are the takeaways from this year's mishaps? Proactive risk mitigation is key. If you're like me you read through your risk management (RM) computer-based training with due diligence. That means you clicked through the slides so fast you had to see the flight doc for carpal tunnel syndrome. The C-130 community is seeing an abundance of mishaps that could have easily been completely eliminated with good RM. Be aware of your environment, the risks you are taking and take the time needed to accomplish necessary tasks. Ask for help when you might need it. Stay watchful over yourself and your wingman.

Overall, FY10 was a great year for our fleet. Take some time to reflect on our successes but also our defeats. Fly safe!

Fighters

U.S. Air Force photo byTech. Sgt. Michael R. Holzworth

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FY10 was the Air Force's safest flying year on record, totaling 14 Class A mishaps for a best-ever mishap rate of .72 mishaps per 100,000 flight hours.

The fighter aircraft community contributed significantly to this feat by reducing Class A numbers from last year (FY09) and increasing our overall safety performance.

In FY10, the fighter community suffered five Class A mishaps for a rate of 1.01 and had one fatality. Overall, the Combat Air Force (CAF) has made tremendous improvements in safety while executing the war effort and balancing critical resources and manning to put iron on the enemy. Still, just as in any debrief from a successful sortie, there are lessons to be learned and possibly a few debrief focus points. The following details for each airframe are for your situational awareness (SA) with highlighted areas of concern. That said, the largest takeaway for FY10 from a safety perspective is that the administrative portions of the mission can be just as perilous as the tactical segments, and even a temporary letdown in SA can be costly. Good briefs and valid tactics naturally lead to safe and effective execution.

Pay attention to your Patch, DO and CC as they help to ingrain the "excellent fighter pilot discipline" and effective tactics that will kill the enemy and keep you and your wingmen alive. Push-it-up and Pilsung!

A-10 Hawgs

The A-10 community finished FY10 with only one Class A mishap, 21 Class B mishaps and zero fatalities. The single Class A mishap, which occurred during takeoff and resulted in a destroyed aircraft but successful ejection, highlights the importance of Go/No-Go decision making during takeoff roll. The takeoff and landing data (TOLD) is there for a reason and helps guide our abort decisions. Aircraft malfunctions will occur when we least expect it; solid procedural knowledge combined with good judgment keeps the attack pilot safe.

Beyond the Class A mishap, the single most important area to highlight is the increased occurrence of compressor stalls and engine failures. These problems are occurring at most bases and have significantly contributed to our Class B and C numbers. Thankfully, careful vigilance and solid emergency procedure (EP) execution have allowed the community to successfully recover the aircraft in all cases when the engine is torched.

F-15C/E Eagles

The light- and dark-gray Eagle community established an impressive safety record this year with only one Class A mishap, two Class B mishaps and zero fatalities. The single F-15E Class A mishap was the result of a bird strike during a low-altitude ingress on a surface attack range. The aircraft was repairable but the ensuing engine fire caused more than $2 million in damages. The crew successfully climbed out of the low-altitude structure and diverted with a chase aircraft to a nearby field.

Looking at the Class B and C mishaps, the standout trend was landing gear malfunctions and damage associated with high speed aborts due to aircraft malfunctions. Again, a good review of TOLD and other abort considerations is crucial during takeoff roll. Crew reactions helped keep a Class B or C mishap from becoming a Class A.

F-16 Vipers

The Viper community experienced three Class A mishaps in FY10, one which was fatal. This fatality occurred during a night rejoin over the water when the wingman lost SA on his flight lead due to an aircraft malfunction and unknowingly set himself up on a collision course. This tragic outcome provides the CAF with its major lesson learned for the year — a breakdown in SA, even for a moment during a relatively benign administrative phase of flight, can still be a killer. It reminds us of the constant vigilance required for flight leads and wingmen to correctly prioritize the tasks at hand and always clear their flight path.

In addition to the Class A mishap, the F-16 community also experienced two Class B and 29 Class C mishaps. The biggest takeaway from these mishaps is the importance of making sound judgments during the landing phase of flight as to whether the aircraft is in the position to make a safe landing. Night and bad weather can complicate the situation, but it remains vitally important to assess aircraft position in regards to the instrument landing system (ILS) and runway and make an appropriate call on the decision to land or go around. We had one Class A and one Class B in which a go-around would have been the better call.

F-22 Raptors

The Raptor community finished FY10 with zero Class A mishaps, zero fatalities and only one Class B. Good on ya! The single Class B mishap occurred during a nighttime Red Flag return to base (RTB) when the aircraft encountered wake turbulence from the flight lead during landing.

This mishap highlights the importance of keeping up SA on parameters and formation position, even during standard recoveries.

Remotely Piloted Aircraft

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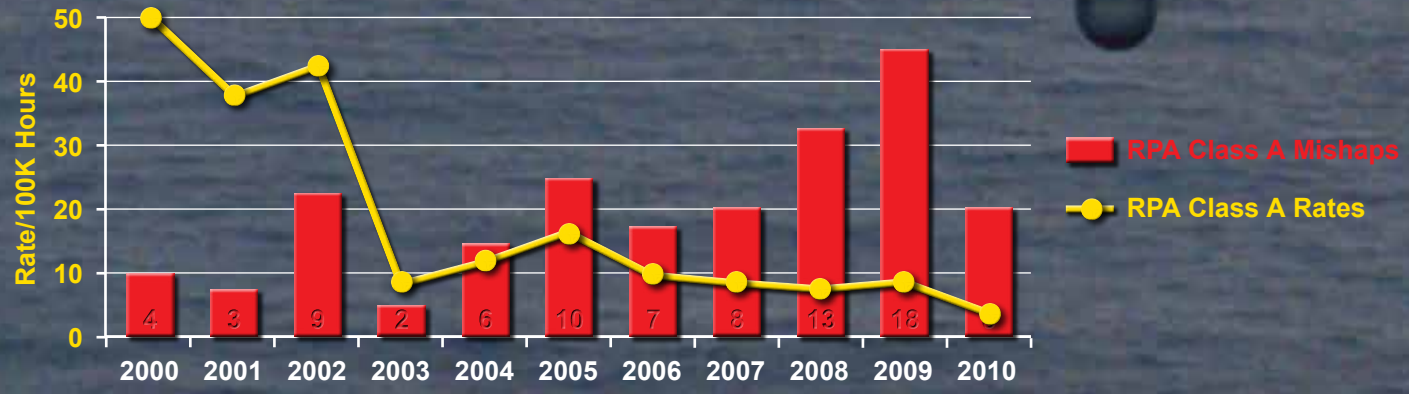
FY10 was an incredible year for remotely piloted aircraft (RPA) mishap rates. In the RPA's ten-year history, FY10 had the lowest mishap rate ever! There were eight RPA Class A mishaps in FY10 resulting in a 56 percent decrease from the 18 mishaps in FY09. The rate for Class A mishaps was 7.78 per 100,000 flight hours in FY09 and 3.06 in FY10 (a 61percent decrease). In fact, Class A, B and C mishaps all decreased in FY10 from FY09. Class B mishaps saw a decrease of 25 percent from four mishaps in FY09 to three in FY10. Class C mishaps saw an even more substantial decrease of 67 percent from 15 mishaps in FY09 to five in FY10. What's changed?

The biggest reason for the reduction in mishaps can be attributed to "engineering out" mechanical deficiencies. While seven of the Class A mishaps in FY09 were caused by either electrical failure (four) or propulsion failure (three), only one electrical failure and two propulsion failures were causal in FY10. Of the three Class B and five Class C mishaps in FY10, six were human error-related, one propulsion mishap and one electrical mishap. Some significant engineering solutions worthy of note were the MQ-1's introduction of the fused dual alternator regulators (DAR) and the MQ-9's new laser altimeter. Already we've seen their value. Unlike FY09, only one FY10 mishap was caused by the DAR, and no MQ-9 mishaps occurred during the landing phase of flight.

It would be remiss not to acknowledge that damage cost thresholds have changed from FY09 to FY10. Only one of FY10's Class B mishaps totaled over $1 million, so that doesn't account for the large decrease in the mishap rate.

Eighty-three reported Class E events occurred in FY10. These were distributed amongst the different categories of bird/wildlife aircraft strike hazard (BASH) (eight), flight controls (eight), Hazardous Air Traffic Report (HATR) (six), High Accident Potential (HAP) (15), miscellaneous (12), physiological (five) and propulsion (29). The MQ-1's propulsion turbocharger has been an identified issue and engineering is mitigating the deficiency.

While the RPA engineering community is dealing effectively with single-point and other mechanical



failures of the aircraft, the "human error" part of the equation remains a large contributor. Of the eight Class A mishaps in FY10, all eight had contributing human factors and of those, six were causal. That means that we had six completely preventable mishaps in FY10.

In five of the mishaps where human factors were found causal, the pilot put the aircraft into a "bad" situation. In other words, the aircraft didn't fail; the pilot's actions, or inactions, directly caused the mishap.

The crew did things like failing to maintain altitude, failing to configure the aircraft correctly for flight/handover, stalling the aircraft, exceeding limits or failing to go around. In the other mishap where a mechanical failure started the mishap chain of events, the crew's reactions were found causal.

Taking a look at the longer term perspective, the Air Force Safety Center conducted a Safety Analysis Team (SAT) review of RPA mishaps spanning the last decade. The goals were to conduct an in-depth hazard analysis on RPA aviation mishaps to identify significant hazards and develop a prioritized list of feasible and effective risk mitigation strategies. This is to aid in reducing the number and rate of future mishaps based upon the hazards identified during the assessment. The top five hazards account for 26.6 percent of the identified risks:

- Automation design affects performance
- Error in accomplishing a written procedure
- Organizational training
- Equipment
- Equipment or vehicle design affects performance

The results of the SAT closely resemble the same issues we are seeing in recent mishaps. When we break down the eight mishaps of last year, we find the top five human factors were:

- Procedural guidance/publications
- Organizational training issues/programs
- Channelized attention
- Over control/under control
- Checklist error

The first two factors are the top two organizational-level human factors identified during FY10. They include but are not limited to Dash 1 and emergency procedures compliance, technical orders compliance, crosswind/heavy weight landings and other critical flight conditions. Reviewing and revising regulations, improving training syllabi and increasing simulator time are just a few ways these factors are being mitigated.

The last three factors are the top person-level human factors identified in FY10. They include focusing on one or a limited number of cues to the exclusion of others, over and/or under controlling the aircraft during critical phases of flight or recovery procedures and making a checklist error or failing to run an appropriate checklist. Some of these factors are being mitigated by redesigning the ground control station, improving training and providing the appropriate sensory feedback to the pilots.

What do we need to know going into FY11? FY10 was a great year and a decrease in mishaps of 61 percent from an already great rate is incredible. Mechanical deficiencies are decreasing and that effort needs to continue. FY10 suffered six completely preventable mishaps. Human factors errors need to be minimized.

As long as pilots are operating the aircraft mistakes will undoubtedly take place. We need to learn to recover better and faster from those mistakes so they do not elevate to mishaps. We're moving in the right direction. We need to learn the lessons of our past in an effort to continue to improve and decrease our mishap rate in the future!

U.S. Navy photo by PH3 Jeff Viano

Helicopters

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FY10 brought bad news for helicopters and tilt rotors. The HH-60s and CV-22s combined for 10 fatalities in FY10. This is 10 too many lives lost and a statistic that we don't want to see again.

We continue to damage aircraft in night vision goggle (NVG) brownout conditions. The H-1s had two Class A mishaps this year due mainly to human factors. Overall, the experience level continues to drop but the operations tempo remains steady.

For FY11, a continuing difficult AOR mission environment and limited training capability needs to be carefully balanced with a thorough risk assessment and mission tasking.

The H-1 series helicopters experienced two Class A mishaps and zero Class B mishaps in FY10. This is a trend that we definitely need to reverse. The first Class A resulted when a UH-1N crew experiencing spatial disorientation during landing made a hard landing that damaged the aircraft beyond repair.

The second Class A mishap was also a UH-1N crew performing an NVG rescue in which they damaged the tail rotor and subsequently rolled the aircraft over during a slide landing attempt. It was a better year for the UH-1H models with no reportable Class A or B mishaps. For FY11, stick to the basics, operate as a crew and try to capitalize on the lessons of past mishaps while continuing to expand the H-1 mission.

The HH-60s experienced zero Class A and three Class B mishaps in FY10. The H-60s were about even again for the 10-year average for mishaps, although there was one "combat" loss resulting in six fatalities. This incident is still being looked at and although not officially a safety mishap, there will be important lessons learned.

The first Class B mishap was an NVG brownout landing in the AOR. Although the Forward Looking Infrared (FLIR), radome and Lightweight Airborne Recovery System (LARS) antenna were damaged, the aircraft was able to be safely flown back to base.

The second Class B was another NVG brownout landing in the AOR where the tail touched down on a berm resulting in a nose low landing. The FLIR and refueling probe were damaged. Once again the aircraft was able to be flown back and landed safely.

The third Class B was yet another NVG brownout.

and Tilt Rotors

U.S. Army photo by Cpl. Robert Thaler

The FLIR was damaged but the aircraft was able to safely return. Ops tempo has remained high for the H-60 community which translates to limited training opportunities and continued mission taskings outside the realm of combat search and rescue (CSAR) and personnel recovery (PR). The community continues to suffer from a steady decline in experience levels across all crew positions due to retirements, separations and Air Force-mandated downsizing. For FY11, carefully balance risk management with the NVG taskings and the urgency of how quickly the aircraft needs to get on the ground in the landing zone (LZ).

On the tilt rotor side, the V-22s experienced one Class A, B and C mishap in FY10. A much better year statistically than FY 09 although the Class A regrettably resulted in four fatalities and 16 injuries. The Class A was the result of the aircraft impacting the ground fast and short of the landing area. The Class B occurred during an air refueling mission in which the hose snapped near the drogue, pulling about 100 feet of wire out of the hose and damaging the aircraft on the return flight. The Class C was the result of the aircraft striking a large bush that damaged the ramp and sponson during a schoolhouse training mission.

One of the biggest challenges for the V-22 community is the relatively low experience levels for operations and maintenance. This is intrinsic with any new system, especially one so complex. The learning curve is high for everyone involved and the mission capabilities and rates continue to improve. In FY11, the Air Force will continue to work closely with the Marines and the manufacturer on the redesign of some systems to facilitate better operational and maintenance capabilities which should translate into improved safety and operational trends.

Although the overall accident rate for the Air Force was lower for the second consecutive year, the helicopter accident rate was higher than it has been in a very long time.

We need to take a step back to basics and focus on good solid risk management when accepting missions, particularly those outside the normal realm of our day-to-day operations. Otherwise, keep up the good work as we continue to accomplish the mission with the hundreds of successful, safe sorties that are being flown.

U.S. Air Force photo by Airman 1st Class Jamie Nicley

Heavy Airlifters

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A two-year trend of avoidable mishaps continued in FY10 centering on the "human" aspect rather than mechanical or design failures. Tragically, FY10 ended with the deaths of four Airmen and the first-destroyed C-17.

Class A and B Mishaps

The C-5 community had one Class A mishap (high speed reject on takeoff roll) for FY10 whereas the C-17 community experienced two. The first C-17 Class A resulted in the death of four Airmen while practicing for an air show; the second is still under investigation but nearly resulted in the loss of all four engines while in severe weather. Although the mishap numbers are low, they still represent a significant increase from FY08 where the combined mishap total was zero.

Class B mishaps decreased for both airframes in FY10. A bird strike accounted for the only C-5 Class B mishap. Ongoing BASH mitigation measures combined with robust efforts inside the combat zone have made good strides in preventing damaging wildlife strikes.

Class C Mishaps and Class E Events

Class C mishaps and Class E events are important because they're our last chance to catch trends before they result in loss of life or extensive damage to equipment — tomorrow's Class A and B mishaps.

The C-17 experienced 49 Class C mishaps (15 flight, 33 aviation ground operations (AGO), one flight-related). The C-5 had 40 Class C mishaps (six flight, 33 AGO, one flight-related). By far, the most prevalent Class C mishap is injuries. Slips, trips and falls while either operating the aircraft or working on the aircraft continued in FY10. The majority of these were AGO mishaps with inattention being the main cause for both maintenance and aircrew. The remaining Class Cs represented no distinguishable trends other than known design deficiencies with corrective actions already in progress.

Class E events included hundreds of wildlife strikes in FY10, but active mitigation efforts on the part of crews, base personnel and planners kept those from becoming Class A or B mishaps. Bird radar is being used in the U.S. Air Forces Central theater to help avoid damaging strikes while still meeting the demands of ongoing combat operations. Class E Hazardous Air Traffic Reports (HATRs) decreased but continue to be worked aggressively inside and outside the war zone.

Human Factors and Overall Mishap Trends

While most C-5 mishaps can be attributed to various mechanical failures, the C-17 community continued to experience preventable mishaps due to human factors. Whether it's the C-17A or the C-5M, the aircraft gets more complex every year. Thus, it's more important than ever to stay in the books, follow procedures and adhere to checklists.

In most mishaps, all the information the crew needs to "break the mishap chain" is presented right before them in the cockpit. Half the challenge is to recognize the information and the other half is to take corrective action. Unlike our single-seat brothers and sisters, we have the benefit of additional crewmembers in the aircraft. Basic crew resource management can save the day or conversely ruin the day if not utilized. If it doesn't feel right, doesn't pass the "gut check" or makes you uncomfortable, then you need to speak up. Leadership can't advise, mentor or correct negative trends unless you voice your concerns.

FY11 Mishap Prevention Focus Areas

Flight discipline, procedural knowledge and proactive crew resource management are our focus areas for the heavy airlift community in FY11. Correcting this two-year trend of human factors-related mishaps will require diligence from all experience levels, crew positions and leadership. Our goal is critical but obtainable: no loss of life or airframes in FY11.

Tankers

MAJ. BILL COVERT
Aviation Safety Division
Air Force Safety Center
Kirtland AFB, N.M.

U.S. Air Force photo by Staff Sgt. Matt Hecht

Tankers continue to keep the Air Force fleet airborne. We have a responsibility in our community to maintain safe flying operations because so many others rely on our gas.

With that concept in mind, our numbers were solid in FY10. The last KC-135 Class A mishap was in May 2008. In the last five years, we've only experienced four KC-135 Class A mishaps. That's an awesome safety record for the number of sorties we've flown! The unfortunate mishaps included a bird strike, ground collision with another aircraft, compressor blade failure and clear air turbulence that resulted in a passenger, who was not strapped in, being paralyzed from a spinal cord injury.

There were nine KC-135 Class B mishaps in FY10, all the result of various engine problems. During the last five years, the KC-135 has seen 88 Class B mishaps. That's an average of just more than 17 mishaps per year. Engine problems continue to be a trend, accounting for over 68 percent of the Class B mishap totals. Other five-year Class B trends include damaged booms, bird strikes and pod scrapes.

The KC-135 community has had 363 Class C mishaps since FY06 averaging slightly more than 72 mishaps per year. There were only 43 Class C mishaps for the KC-135 in FY10, well below the average. Five-year Class C mishap trends include smoke and fumes, maintainer injuries and boom damage. To mitigate these hazards, pilots need to continue refining their "pod-proofing" techniques (if you don't know what I'm talking about, see your IP immediately) and boomers need to be directive in back. To mitigate bird hazards, keep that jump seat occupied and tell the boom operator to stay alert.

In the KC-10 Extender, we've enjoyed similar success. Our last Class A mishap was in April 2008 with a five-year total of seven mishaps. All but one of these was due to some type of engine malfunction – combustor pins, compressor damage, metal shavings, bearing failure, high pressure turbine nozzle. The exception was a malfunctioning boom that impacted a jumpy receiver that didn't listen to the boomer's instructions.

There were zero Class B mishaps in FY10 making it one of the best years ever for the Extender. Like the KC-135, engines were also a trend in the KC-10's five-year Class B mishap history (only 22 total mishaps) along with various boom and drogue damage mishaps.

There were 84 KC-10 Class C mishaps in the last five years. The trends during this period included bird strikes, boom and drogue damage and engine damage. To mitigate these trends, continue to check for local bird status and avoid takeoffs or landings in the golden window around sunrise or sunset. When things do go bad up there, make sure you follow your checklists and take the time to properly write up the problem during your debrief.

FY11 poses the same challenges as last year. Let's be smart out there – it's not just our missions on the line.

Trainers

MAJ. PETE LAURIN
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T-1

It was another excellent year for the T-1 community with zero Class A or B mishaps. The last Class A occurred in FY08 and the last Class B in June 2004; both mishaps were related to weather.

There were two Class C mishaps in FY10, the same number experienced in FY09. This year's Class C mishaps both started with a left main tire failure, followed by a wheel well fire on one aircraft and the other departing the runway. In comparison, we saw aircraft damage during towing and a bird strike in FY09.

FY10's Class E events were as follows: 16 BASH, three HATRs and two HAPs. For each HATR, the T-1 crew complied with the TCAS RA. The HAPs involved a T-1 striking a wing on landing due to a wind gust and a blown tire on takeoff leading to an abort on the runway.

Tire issues accounted for both Class C mishaps and one Class E mishap in FY10. Continue to complete thorough preflights with attention to tire condition, wear and tear. Remember, a Class E or C mishap could turn into a major mishap if established procedures aren't followed.

T-6

The T-6 community was six days away from completing FY10 with zero Class A mishaps; however, an engine failure with no relight spoiled a perfect year. Fortunately, both pilots successfully ejected, albeit at a lower-than-recommended altitude. One Class B mishap occurred during FY10 when a solo pilot ejected after landing on rollout prior to the aircraft departing the runway. Last year the T-6 community suffered one Class A and zero Class B mishaps.

Eight Class C mishaps occurred in FY10, compared to 19 in FY09. Well done T-6 folks! The T-6 propulsion system continues to be an area of high interest as it has accounted for seven of the Class C mishaps (compared to six last year.) The engine manufacturer, system program office (SPO), maintenance and numerous other organizations continue to work diligently to resolve the underlying engine issues.

Class E mishaps increased slightly to 193 from FY09's total of 188. The top three Class E mishaps were BASH events followed by miscellaneous (fumes in the cockpit) and physiology (sinus blockages) incidents. Other

U.S. Air Force photo by Staff Sgt. Matthew Hannen

occurrences worthy of review and discussion were 10 Class E HATRs compared to eight in the previous year. Eight HATRs were between T-6s and civilian aircraft while the other two were near-midair collisions between T-6s. Vigilance while flying cannot be overstated; keep the scan going while listening carefully on the area or ATC radios.

T-38

The T-38 community had an outstanding year with zero Class A or B mishaps. This is in contrast to two Class A and four Class B mishaps in FY09. Great job T-38 aircrews and ground crews!

On another good note, the number of Class C mishaps decreased to 24 from 35 in FY09. One third of the Class C mishaps were caused by bird strikes with propulsion events coming in second. One item of interest was a T-38 canopy departing the aircraft on takeoff and striking the aircraft tail. Fortunately, the crew reacted properly and aborted safely while on the runway.

The majority of all T-38 mishaps in FY10 were Class E events (221) – the total number of mishaps for all categories was 250. BASH was the number one cause with 126 incidents, followed by 49 propulsion incidents, then HATR with 17 incidents. Regarding BASH, seeing and avoiding birds is difficult at the best of times and factors, such as lighting conditions, migratory seasons and altitude (yours or theirs) can all work for or against aircrews. I nearly had a head-on collision with a pelican at 12,500 feet – not exactly an altitude where one expects to encounter a bird. The best you can do is follow your group rules and regulations regarding BASH and keep a good lookout.

Trainer Aircraft Wrap-Up

FY10 turned out to be a very good year for the training community with one Class A and one Class B mishap. This is down from FY09 where we saw three Class A and five Class B mishaps. Well done to all in the training world and thanks for the great work by the flyers and maintainers of AETC this past year! Continue to remain vigilant, train well and fly smart.

U.S. Air Force photo by Master Sgt. Michael Featherston

Maintenance

SANDY STACY
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Air Force Safety Center
Kirtland AFB, N.M.

I've been asked several times in the last few months how many maintenance mishaps were caused by human factors. The answer? All of them. We've defined a maintenance mishap as "on-equipment damage as a result of maintenance error … it does not include technical data inadequacies unless it's proven that supervision/workers knew the data were in error and made no attempt to correct."

So what's a human factor? Simply put, human factors identify "why" we didn't do something we should've done. Failing to follow technical data, fatigue, complacency, lack of supervision, checklist errors, distractions, etc., are all human factors. So when a maintainer fails to torque a bolt, it's not that simple. Why didn't the maintainer torque the bolt? Was the maintainer tired? Was the maintainer distracted? Or did the maintainer fail to follow the T.O.? It's important to dig as deep as possible in a mishap investigation to determine what really happened so we can keep it from happening again.

Historically, maintenance has caused an average of 14 percent of all Class A, B and C aviation mishaps. In FY10, maintenance was responsible for three Class A, nine Class B and over 60 Class C mishaps. Finding the root causes of these mishaps is the key to preventing the same thing from happening again in future years. The following are a few of the aviation mishaps that occurred in FY10:

Class A and B Mishaps

• An aircraft ran out of gas in flight and was forced to land. It was determined that the fuel strainer had not been correctly installed.

• During an engine run, an aircraft departed the prepared surface causing extensive damage to the aircraft. This was not the first incident like this, and supervision failed to mitigate the problem. In addition, the run crew failed to complete the emergency checklist.

• An aircraft crashed on takeoff due to lack of airspeed indications. The pitot tube was obstructed by an insect nest. Supervision failed to ensure protective covers were installed.

• An engine ingested a canopy pin during recovery. The maintainer unknowingly dropped the pin.

• A vertical stabilizer was damaged during repairs. Vacuum bagging was completed incorrectly resulting in metal directly against metal instead of insulation.

• An engine ingested a mouthpiece (FOD). An unqualified specialist assisting in recovery got ahead of the checklist.

• A crew chief failed to ensure a water intrusion plug was removed from the aircraft during launch (FOD). Supervision failed to enforce proper procedures.

• An engine ingested a screwdriver during a maintenance engine run (FOD).

• An engine was dropped during installation. The forward hoist cable attachment was incorrectly installed. An unqualified maintainer failed to follow technical data.

• Engine vibration in flight. An E-seal was damaged during the installation of a high-pressure turbine.

• Left main landing gear (MLG) wouldn't retract on takeoff. A previously broken shear pin wasn't identified during the postflight inspection. Supervision failed to act when technical data faults were identified.

• A fuel tank was overpressurized during refueling. An improper plug/cap was used inside fuel lines (FOD).

In FY10, we caused over 60 Class C mishaps and cost the Air Force more than $8 million. What went wrong to trigger these events? Towing errors contributed to 11 percent of our mishaps. Like in previous years, we've also had some issues with not using torque wrenches. Torquing errors contributed to 13 percent of our mishaps. Incorrectly installing parts, bearings, cotter pins, etc., was responsible for 15 percent of our mishaps.

In addition to the above discrepancies, we had a smattering of hitting aircraft with stands, not removing protective covers prior to flight and we failed to annotate the aircraft forms on a few occasions.

What can we do to prevent maintenance mishaps in the future? Many of the mishaps discussed in this review could've been avoided by simply following the T.O. With very few exceptions, the tasks we perform as maintainers are all written down for us. Torque values have been established. Launch procedures tell us to remove protective covers. Towing checklists include what wing walkers are supposed to do. Every T.O. I've ever read that directs moving flight control surfaces directs us to move stands away from the aircraft. Following the T.O. is always the best thing to do when working on aircraft.

It's up to each and every maintainer from the lowest airman to the commander to follow established procedures. Remember to look out for each other, and let's make FY11 the safest year ever for maintainers.

Photo Illustration by Dan Harman

FY10 Top 10 Reasons Maintainers Damage Aircraft:

10. Illegally modified part

9. Failed to document forms

8. Part damaged during install

7. FOD

6. Equipment ingested

5. Running into equipment

4. Supervision

3. Incorrect torque

2. Inattention, complacency, confusion

1. Failed to follow technical data

FY10 Maintenance Trend Areas:

- Aircraft covers not being removed prior to flight resulting in engine ingestion
- Aircraft covers not being installed resulting in insect infestation
- Supervision not taking appropriate actions
- Failure to torque items correctly
- Towing mishaps

SENIOR MASTER SGT. DAVID A. GURLEY JR.
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Kirtland AFB, N.M.

Are you looking for an opportunity to learn a new skill and broaden your aircraft maintenance knowledge? As maintainers, we have a variety of unique opportunities to choose from that will allow us to continually grow in the aircraft maintenance career field. Some of the positions offering new and unique challenges include quality assurance (QA) inspector, maintenance operations center (MOC) coordinator and maintenance training instructor.

I'd like to introduce you to another challenging position: the flight safety noncommissioned officer (FSNCO). I hope this isn't the first time you've heard of this position! I've put together a list of frequently asked questions (FAQs) to help you understand the FSNCO position, its responsibilities and how to become one.

Q: *Which bases have FSNCO positions?*
A: Each wing with a flying mission gains one FSNCO position. There's also a manpower variation that grants one position to units without a flying mission (but are required to perform flight line tasks in support of transient aircraft). See Air Force Manpower Standard 106A for additional information.

Q: *Where are FSNCOs assigned on a base?*
A: The FSNCO is a member of the flight safety staff within the wing safety office. Normally, personnel assigned to this position have an aircraft maintenance background and are experienced in the unit's assigned aircraft. Some MAJCOMs have FSNCOs assigned to the flight safety division within their safety directorate. Also, a maintenance chief is assigned to the Air Force Safety Center at Kirtland AFB, N.M.

Q: *What type of duties do FSNCOs perform?*
A: The FSNCO brings maintenance expertise to the flight safety staff. That expertise is used during the monitoring of aircraft maintenance activities — such as spot inspections. The FSNCO is the maintainer's liaison within wing safety and is available to assist in any maintenance safety-related issues. The FSNCO provides mishaps statistics and cross-tell information. In the event of a mishap, the FSNCO investigates to determine root causes and prevent similar mishaps from occurring in the future.

Other programs the FSNCO may be involved with include airfield safety (operations, maintenance and construction), midair collision avoidance (MACA), bird/wildlife aircraft strike hazards (BASH), operational risk management (ORM), foreign object damage (FOD), aero clubs, safety training and safety awards.

Finally, the FSNCO position offers high visibility. The FSNCO interacts (through briefings and meetings) with wing, group, squadron, flight and section leadership.

Q: *What training is required to become a FSNCO?*
A: As a minimum, the FSNCO should attend the FSNCO and Jet Engine Mishap Investigation (JEMIC) courses. I recommend FSNCOs attend both of these

Flight Safety Noncommissioned Officer:
Do You Have What it Takes?

Illustration by Dan Harman

courses along with the Aircraft Mishap Investigation Course (AMIC). In order to be a maintenance member on a Class A or B aircraft mishap, or the investigating officer on a Class C aircraft mishap or Class E aircraft event (with no operator factors), the FSNCO must attend either AMIC or JEMIC.

Q: *Who should become a FSNCO?*
A: The FSNCO should be an aircraft maintainer experienced in the unit's assigned aircraft. It should also be someone with a strong desire to improve safety for aircraft maintenance and the maintainer. The FSNCO should be eager to learn, manage multiple tasks, respond well under pressure and effectively and efficiently interact with all levels of personnel (enlisted, officers and civilians). Applicants applying for the FSNCO position at wing and MAJCOM levels should be interviewed by the appropriate chief of safety; only individuals of the highest caliber are selected.

The FSNCO represents aircraft maintenance safety at the wing level and should be someone of high regard and recommended by the maintenance community.

Q: *If I become a FSNCO, is it a promotable position?*
A: Simply holding a position doesn't guarantee promotion. However, how well an individual executes the responsibilities given to them is definitely a factor. There are also other things to consider (PME, fitness, education, community involvement, mentoring, WAPS testing, etc). If you hold a FSNCO position and you excel, you can be promoted.

Personally, I've filled FSNCO positions at the wing and MAJCOM levels. They were very rewarding but challenging positions. My typical week in flight safety was anything but routine. My duties could include airfield construction project reviews with CE, spot inspections in maintenance, performing wildlife control measures on the airfield, conducting mishap investigations, briefing senior leadership on safety-related issues, responding to in-flight emergencies, researching and trending mishap-related data, scheduling safety training, teaching dedicated crew chief classes and the list goes on.

As a result of accepting the challenge and always performing at my best, I feel these positions greatly contributed toward my promotion to Senior Master Sergeant and selection for promotion to Chief Master Sergeant.

If I've captured your attention and becoming a FSNCO is something you'd like to strive for, talk to your supervisors and let them know. Get to know your wing FSNCO and possibly "shadow" him or her for a day. Talk with the folks at wing safety to see if you can get scheduled for an AMIC or JEMIC class. Since there's usually only one position available at a wing, do the things to set yourself apart from others. Show leadership that you are the best and are ready to take on the responsibility for leading the aircraft maintenance safety efforts at your wing. I challenge you!

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.

Lt. Col. Stephen Dunai
Maj. Richard Svardahl
Capt. Brandon Morgan
115th Fighter Wing
Madison, Wis.

The Aviation Well Done Award is presented to Lt. Col. Stephen Dunai, Maj. Richard Svardahl and Capt. Brandon Morgan, crew of Hondo 28, 115th Fighter Wing, Madison, Wis., in recognition of their exceptional airmanship. On March 16, 2010, the crew of Hondo 28 flew a mission in support of a special operations combat mission over northern Iraq. The aircraft lost its hydraulic system one hour into the flight rendering the flaps, normal gear extension and nose wheel steering inoperative. The crew immediately terminated the mission portion of the flight, headed south to Balad Air Base, Iraq, and executed the emergency gear extension checklist. The gear didn't initially lock into place but after additional efforts with the manual pump, a safe landing gear indication was achieved. Hondo 28 executed a flawless precision instrument landing system approach despite very poor weather conditions consisting of 400-foot overcast, 14 knots of crosswind and half-mile visibility. As the aircraft reached 80 knots, rudder authority was totally lost. While the crew applied brakes, the aircraft immediately veered to the right due to failure of the left brake. The crew selected full reverse on the left engine and positive power on the right. This skilled action resulted in straightening the aircraft for the remainder of the landing roll coming within a few feet of the right edge of the runway. The outstanding leadership and safety awareness displayed by the crew of Hondo 28 reflect great credit upon themselves, the Air National Guard and the United States Air Force.

Lt. Col. Scott Fredrick
13th Fighter Squadron
Misawa Air Base, Japan

The Aviation Well Done Award is presented to Lt. Col. Scott Fredrick, 13th Fighter Squadron, Misawa Air Base, Japan, in recognition of superior performance during an emergency that occurred on April 26, 2010. While conducting simulated close-air-support attacks, Lt. Col. Fredrick experienced an engine fire near Oshima Island, 30 miles off the west coast of Japan. While recovering from a low-altitude attack, he noticed an overheat and engine fire warning light in the cockpit. He climbed the aircraft and began proceeding to the nearest emergency divert airfield approximately 70 miles away. During the climb, his wingman confirmed the aircraft was trailing smoke. Lt. Col. Fredrick expertly coordinated with numerous air traffic control agencies while enroute to the emergency airfield. Once Lt. Col. Fredrick assessed the aircraft was within gliding distance to Aomori, Japan, he retarded the throttle to idle power to eliminate the overheat condition. Lt. Col. Fredrick established his aircraft on parameters for a random entry flameout landing through difficult terrain and expertly maneuvered his aircraft to land safely from a flawless approach on a runway lacking an aircraft arresting system. After performing an emergency ground egress and confirming the aircraft was no longer on fire, he discovered a hole had burned through the aft fuselage section. Lt. Col. Fredrick's decisive actions limited damages and ensured the safe return of a multi-million dollar aircraft. The outstanding airmanship and safety awareness displayed by Lt. Col. Fredrick reflect great credit upon himself, Pacific Air Forces and the United States Air Force.

Joint Test Assembly Management

JOHN FISHER
708th Nuclear Sustainment Squadron
Kirtland AFB, N.M.

Photo courtesy of NNSA

As an Air Force member, you may have the opportunity to receive and store Joint Test Assemblies (JTAs) to be utilized by the Department of Energy (DOE) or Department of Defense (DOD) for operational or developmental testing purposes.

By definition, a JTA is a non-nuclear munition that is a representation of a War Reserve (WR) nuclear weapon in physical appearance and characteristics of a WR weapon. However, "don't always believe what you see" as the ol' saying goes, specifically in relation to the hazard classification of a JTA during Department of Transportation (DOT) operations and subsequent DOD storage. Routinely, technicians on the ground receive JTAs with hazard classification markings that are not representative of what normally would be assigned to a JTA while in DOD storage.This can cause confusion and even greater concern in the explosive safety arena.

As an example, a JTA arrives at a DOD facility placarded as 1.1D Hazard Class by DOT standards, yet the DOD facility stores the JTA as 1.4D Hazard Class. This seems as if the DOD facility may have made a considerable error in properly storing the JTA upon receipt, or potentially the JTA was marked improperly when prepared for shipment at the shipping location by the DOT courier. Would you believe neither is the case? The simple explanation is as follows: During the DOT transportation phase the hazard classification of a JTA is assigned in accordance with the applicable DOT hazardous material regulations per Title 49 Code of Federal Regulations (CFR). The 49 CFR governs transportation of hazardous materials in all modes of transportation — air, highway, rail and water. JTA hazard class markings while in DOT custody typically defer to a higher (more stringent) classification due to the most extreme hazard association, and no special considerations are applied.

On the other hand, while in the custody of a DOD storage facility, the hazard classification of a JTA is assigned through the application of several instructions, manuals and technical orders. Specifically, in accordance with Technical Order 11A-1-47, Department of Defense Ammunition and Explosives Hazard Classification Procedures, when explosives are received by a service component, the service classification authority can re-classify as outlined in this T.O. The application of this authority to the type of explosives the JTA contains and probabilities of their interaction in the event of an incident and/or accident, combined with a comprehensive understanding of Joint Nuclear Weapons Publications System Technical Publications 11N-20-7, Nuclear Safety Criteria, and 11N-20-11, General Guidance and Material Hazard Information for Nuclear Weapons, Components and Nonnuclear Designations, allows for a lesser hazard classification to be applied to the JTA while in DOD custody.

The Air Force Safety Center located at Kirtland AFB, N.M., is our service classification authority, and through coordination with the applicable Service Logistics Agency (SLA), can facilitate the re-classification of a hazardous classification of JTAs if required.

Armed with this information, the potential differences between DOT and DOD JTA hazard classifications can be managed, defined and ultimately in compliance with established explosive safety standards. This is exactly what each and every wingman should expect from his or her fellow Airman.

The Air Force Nuclear

HAROLD CAMACHO
JOHN WASKIEWICZ
498th Nuclear Systems Wing
Kirtland AFB, N.M.

This article is the first in a series of articles outlining the nuclear certification process.

Execution of the nuclear certification process applies to new weapon system developments as well as to modification efforts to already nuclear-certified systems or items. The nuclear certification process consists of four phases: identification, administration, fielding and sustainment. In this article, we'll briefly discuss the premise of the nuclear certification process by outlining the requirement for nuclear certification and the basic elements of the process.

The Air Force Nuclear Certification Process, as laid out in Air Force Instruction 63-125, Nuclear Certification Program, supports the overall Air Force Nuclear Surety Program by establishing the processes, procedures and responsibilities for obtaining and maintaining the nuclear certification of nuclear weapon systems, support equipment, hardware, software and facilities.

Nuclear certification for these systems and items is mandated by DOD 3150.2, DOD Nuclear Weapons System Safety Program, and DOD 3150.2M, DOD Nuclear Weapon System Safety Program Manual, and must be accomplished before a weapon system or piece of support equipment can be used with nuclear weapons.

AFI 63-125 provides the overarching process requirements that the product providers, major commands and users must accomplish in order for a weapon system or item to be nuclear certified and listed in the Master Nuclear Certification List. To nuclear certify a nuclear weapon system or item takes the participation of many agencies and organizations throughout the Air Force and the process is managed by the Air Force Nuclear Weapons Center (AFNWC) at Kirtland AFB, N.M.

There are two major elements that make up the nuclear certification process: design certification and operational certification. Each of these elements, in turn, is made up of several components. Design certification consists of nuclear safety design certification, compatibility certification, technical order certification and weapon

U.S. Air Force photo and photo illustration by Dan Harman

Certification Program

system safety rules. The operational certification element is comprised of the following components: qualification training, Personnel Reliability Program (PRP), nuclear surety training and Initial Nuclear Surety Inspection (INSI).

In the Design Certification element 1) the Air Force Safety Center Weapons Safety Division (AFSC/SEW) examines the system or item's design for compliance with nuclear safety design criteria laid out in 91-series guidance; 2) the AFNWC assesses the electrical, mechanical and aerodynamic compatibility of the item or system with nuclear weapons; 3) technical orders are assessed to ensure the procedures related to the nuclear weapons systems nuclear mission operation, maintenance, troubleshooting, OPCERT, DECERT, handling, movement, restraint configuration loading, unloading, delivery and testing are properly verified and validated; and 4) AFSC/SEW determines if the Air Force Nuclear Weapon System Safety Group needs to be convened to develop or modify weapon system safety rules for the system.

The operational certification element of the process assesses the development effort or modification for impacts on the user. Specifically, the using MAJCOM is asked to determine if the new system development or modification effort requires additional task qualification or nuclear surety training as well as PRP qualification/certification for the maintainers or operators of the system. In addition, the MAJCOM determines if an INSI must be conducted on the units receiving the new system or modification prior to the item being placed into operational service.

This completes the initial discussion of the nuclear certification process. In future articles, we will examine the various phases of the process in more detail.

If you would like more information on the nuclear certification process, the AFNWC offers a Nuclear Certification Process course and CBT that you can take by accessing the AFMC Nuclear College CoP at https://www.my.af.mil/afknprod/community/views/home.aspx?Filter=OO-AQMC-95. Additional guidance and information regarding the nuclear certification process can also be obtained by visiting the 498th Nuclear Systems Wing, Certification Management Section's CoP at https://www.my.af.mil/afknprod/community/views home.aspx?Filter=21983.

Great Expectations

U.S. Air Force photo byAirman 1st Class Katherine Windish

CHIEF MASTER SGT. BURRELL HANCOCK
Safety Enlisted Career Field Manager
Air Force Safety Center
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"In a word, I was too cowardly to do what I knew to be right, as I had been too cowardly to avoid doing what I knew to be wrong." — The narrator Pip, Great Expectations by Charles Dickens

Regardless of your career field, component of the Total Force, age, religion, rank, gender or other demographic variation, I ask, "What kind of Airman are you?" Are you the kind of Airman who habitually uses training funds for yourself before using them for those who work for you?

Are you the kind of Airman who sits by and says nothing while your leadership plots an incorrect course? Are you the kind of Airman who constantly requires oversight? Are you the kind of Airman who allows yourself to be improperly coded so others have to take your deployment? Honestly, "What kind of Airman *are* you?"

I assured the Safety career field (1S0X1s) of two things when I became the career field manager:

1) I will not forget where I came from and,

2) I will confer with my fellow Chiefs to ensure transparency while managing the issues which affect them individually and collectively.

I hope I have kept and continue to keep my word. As the career field manager, my desire is for all 1S0s to be smarter, better developed and achieving more than I am. As a Chief Master Sergeant in the Air Force, I expect you, the individual Airman, to exude our core values of Integrity First, Service Before Self and Excellence in All We Do. When I say "exude" I mean "live" and "embody" these values in such a way that it causes your leaders, peers and subordinates to take notice and take stock of themselves. For them to ask the question, "What kind of Airman am *I*?

"

I expect every single Airman to improve and advance, to pick up and press on. To assist you in making this a realization, I urge you to focus on the following:

- Deliberately develop your Airmen. Ensure they're always at their occupational best and properly prepared to become our successful leaders of the not-so-distant future.
- Teach your Airmen to think for themselves: stop micromanaging.
- Instill character, integrity, sincerity and resiliency: be the example.
- Encourage them to maintain a healthy lifestyle.
- Let them know it's OK to fail but never OK to cover it up.
- Expect to succeed. Display the confidence, poise and "swagger" necessary to influence your environment.
- Hold your subordinates accountable. Correct unsuitable behavior and promptly reward exemplary behavior.
- Be responsive to people; stop reacting to circumstances. "No" is the quick and easy answer; conduct research or make a phone call on someone's behalf. Be compassionate; they contacted you because they need your help. If you've lost the capacity to care for Airmen, then it may be time for you to move on.
- Know yourself. What is your fatal flaw? How can you improve? Take steps to make your actions more mature.
- Control yourself. How do you react in certain situations? What does your quick temper truly reveal? Be honest.
- Have faith in the system. Allow the system to work but don't let it steamroll your Airmen. Leaders, you are their top cover.
- Prioritize. First things first: Rocks, pebbles then sand. Make a list. Go home on time; the work will be there tomorrow. If you're always working overtime and the workload remains, you're doing something wrong.
- Leaders, foster an environment where open communication is welcome.
- Hold your boss accountable. Inform leadership of your goals and let them know how they can assist you in achieving them.
- Support your leadership. Be a good follower. Be reliable. Be a confidante.
- Don't be afraid of opposition. Resistance and disagreement make you and your stance on an issue stronger.
- Don't forget where you came from.

With that said, I ask, "What kind of *Airman* are you?" Are you the kind of Airman who holds his or her Airmen accountable in a positive way and rewards their efforts with awards submissions, time off and "thank you's?" Are you the kind of Airman who is properly coded for deployment and ready to go when called on? Are you the kind of Airman who personifies Service Before Self and upgrades your Airmen appropriately, even though you know they will have a permanent change of station as soon as they are upgraded? Are you the kind of Airman who has the courage to empathize with someone and assist them in times of trouble?

Regardless of who you are or what you do, you are an Airman. My "Great Expectation" is for you to do what you know to be right and avoid what you know to be wrong. When you fail — and all forward-thinking, innovative leaders who take risks will fail — my "Great Expectation" is for you to realize you are not bound to failure, you are born to fly.

"What kind of Airman are *you*?"

Career Field Manager's Ground Safety Training Path

1) Earn 3-skill level (Apprentice)
2) Attend ESOH Symposium (complete OSHA 10-hour certification)
3) Earn 5-skill level (Craftsman)
4) Complete Mishap Investigation Non Aviation (MINA) Course
5) Complete OSHA 30-hour certification
6) Complete Safety Managers Course
7) Earn 7-skill level (Supervisor)
8) Complete Chief of Safety Course (for one-deep positions w/ proper justification)
9) Participate in safety professional development course(s)

Improving Orbital Safety

MAJ. DUANE BIRD
U.S. Strategic Command
Offutt AFB, Neb.

The U.S. government is one of the few organizations able to fund and conduct space surveillance. Unfortunately, we haven't matured our equipment or processes to the point that we were able to prevent the Iridium-COSMOS collision in February 2009. As a result, there are two belts of debris orbiting our planet today, each containing thousands of pieces — they will remain a hazard for years to come.

In the latter half of 2009, Congress passed legislation allowing U.S. Strategic Command (USSTRATCOM), in essence, to provide space situational awareness (SSA) services and information to, and obtain SSA data and information from, non-U.S. government entities after they sign an agreement. At a minimum, an agreement enables the Joint Space Operations Center (JSpOC) to screen routine satellite maneuvers to ensure a satellite operator doesn't maneuver into a collision. Signing an agreement also allows the operator to tailor conjunction warnings to meet their ops tempo/thresholds. Since space flight safety is in everyone's interest, USSTRATCOM has also obtained legal authorization to contact any satellite operator after identifying a close approach.

The JSpOC currently screens every active satellite using its most accurate data, known as special perturbation (SP), or SP data. SP numerically integrates the equations of motion including all necessary perturbing accelerations, thus making SP data more appropriate for conjunction assessment than general perturbation (GP) data. GP data is available on space-track.org and is further redistributed by popular websites such as Heavens Above, CelesTrak, etc.

This past summer USSTRATCOM started sharing detailed conjunction summary messages (CSMs) for the conjuncting objects. CSMs contain the SP data of the two objects as well as the covariance matrices, or error ellipsoids for both objects.

With the data from the CSM, the satellite operator has all the information necessary to avoid the other object. To ensure they don't maneuver into another orbiting object, owners/operators (o/o) send maneuver ephemeris to the JSpOC, where it's screened against all other orbiting objects, including those not posted to the public website — about 6,000 objects.

This past summer, USSTRATCOM hosted a CSM workshop near Washington, D.C. Our orbital analysts led a discussion and fielded questions from approximately 50 flight dynamics personnel from 30 different organizations. The intent of these workshops is very simple — to educate

Through Data Sharing

Image courtesy of NASA

satellite operators on the CSM so they can provide a fact-based recommendation to their company or government on whether they should maneuver or not, weighing the cost and risk as only the o/o can do.

Although the JSpOC uses its best data to calculate whether two objects are approaching too closely or not, if those particular objects have not been tracked recently, the satellite's predicted position may be off a bit from its actual position. Satellite operators have accurate positional data on their own satellites. In some cases, that data is more accurate than the SP data. USSTRATCOM has developed a process to accept this data to screen it. Another relatively new feature is the ability to screen two ephemeris files against each other. There's more to avoiding a collision than merely identifying the close approach in enough time to conduct a maneuver. We must clearly communicate the message from the JSpOC to the satellite operator.

In recent years, the benefits of developing international standards for space data have become more prevalent. USSTRATCOM recently began working with the Consultative Committee for Space Data Systems and will present a concept paper, proposing that the international community develop an international standard for conjunction assessment messages. In addition, there is some discussion about collaborating on a launch conjunction message in the future.

Over the next five years, we expect to make orbital information available to others net-centrically by implementing a service-oriented architecture at the JSpOC. In addition, we have high hopes for new sensors that will increase our ability to track small objects, and track them more accurately. We also hope to increase our international ties as other countries bring new telescopes, radars and satellites to bear to reduce the problem of sparse data.

The last 18 months have brought on vast changes in the way we conduct and share SSA. Many decades-old policies have been changed as a result of rationally questioning why the policy was originated. In some cases, we have re-examined security issues and decided the risk of not sharing the data outweighed the risk of sharing it. Just like I couldn't have predicted a year ago that we'd be sharing CSMs, developing an international standard and accepting o/o ephemeris, I don't know what we'll be doing this time next year. If we continue working with all o/o, space will continue to be a safe frontier for all.

Standardize Change

JACQUELINE KAISER
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Standardize change! This process improvement mantra can be applied to safety. What exactly does this mean? Change needs to become a standard operating procedure in our Air Force. The question is why?

We need to continually improve the way we conduct our business, carry out our processes and develop ourselves. We shouldn't be afraid of change. In previous years, we've been told to cut resources, budget wisely and decrease operating costs with an ever-increasing workload — this trend will continue. We can't remain at the current tempo and accomplish our tasks to perfection with decreasing resources, so we have to adjust and change our priorities. We can't afford to do business as usual without changing. I know we've heard this all before, but have we really listened?

We're always striving to do our best. However, with reduced resources and increased workload, we're often spread thin and unable to give maximum effort to everything, giving less and less while settling for the 80-percent solution that results in increasing mishap and anomaly trends.

Recognizing these trends, how can we as safety professionals help our programs and change the way we do business within the scope of our safety responsibilities? Let's review some major mishaps that might offer some insight into improvement areas that we can direct our focus.

Most are familiar with the Challenger and Columbia space shuttle mishaps. These are both perfect examples of living with the "faster, better, cheaper" mentality and a slew of managerial decisions and compromises. Another example is the Arianne 5 rocket loss due to reusing software from the Arianne 4 — another managerial decision to save time and money. Air Force Space Command recently experienced a major orbital mishap due to many factors with management decisions stemming from the pressure to decrease costs and meet schedule. The common thread in each of these mishaps appears to have been management's need to decrease costs and save time. This approach ended up playing a key role in each of the accidents.

What can we do differently as safety professionals? How can we help institute change? One thing we can do is to ensure firm requirements since often one of the causal factors on mishaps traces back to wrong requirements, right requirements communicated incorrectly, missing requirements or requirements creep. Understandably, for space systems this is an area hard to affect change due to the long acquisition cycle for space systems development. Safety professionals can certainly make a difference in this area. Let's think outside the box and involve everyone early in the acquisition process. Even if the concept or theory doesn't seem necessary, let the experts make that judgment.

Photo courtesy of NASA

Another way we can bring about change is through our test communities, specifically the integrated test teams (ITT). Once again, involve everyone early in the process and see how many mishaps or anomalies we can prevent by employing the "test like you fly" principles. Although end-to-end testing can sometimes be cost prohibitive, and we frequently rely on modeling and simulation, we must be aware of the hard-to-model systems as well as those systems sensitive to modeling errors to ascertain appropriate risk. As safety professionals, we can educate ourselves through reading past mishap reports and reviewing papers from academia. This will help us to focus and better understand residual risk of not testing and the risk of relying primarily on modeling and simulation.

Lastly, we can change how mandates for the numerous plans and hazard analysis assessments are levied upon programs and program offices. We need to ensure the safety tools and techniques that are required are value added for everyone. Often, many hazard assessments and analysis are put on contract, but the deliverables are not always well understood by either party. We need to better communicate our safety requirements by slimming them down to what we really need.

This will enable all of us to work more effectively as a team and standardize change. Don't get so focused on the tree that you miss the forest. Let's watch more natural history programs and take a lesson from nature. These programs depict how the animals' environment helps shape behavior. By analogy, in order to understand the causes of mishaps (past and future) we need to look at our organizational structure and determine if this environment is conducive to a healthy safety culture.[1]

I'm confident that as safety professionals you have many other ideas for improving your safety programs. Don't wait until we are Monday morning quarterbacking after a mishap — employ those fabulous ideas now! It's OK if they're different. Remember to standardize change, think outside the box and affect a safer system tomorrow.

Reference:

[1] C.W. Johnson, *"The Natural History of Bugs: Using Formal Methods to Analyse Software Related Failures in Space Missions"* (2005).

Why Space Weather Matters

CAPT. COY HARVEY
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Imagine that you're an astronaut on the International Space Station (ISS). You're at the end of a long day of managing science experiments and performing preventative maintenance on the station. After spending a spare moment gazing out the window, you decide to turn in. Almost immediately, an emergency alarm goes off and ground control tells you and the rest of the crew to head to the sheltered parts of the station. Why are we sheltering? Because the ISS is going to be hit with high doses of radiation from the sun. It's not safe for humans to be in the less-protected areas of the ISS. This scenario has happened many times.

Space weather is defined as radiation, particles and light emitted from the sun that bombards the earth. These effects can vary from negligible to extreme and are somewhat unpredictable. Through observations over time, we've determined that the sun goes through a solar cycle that lasts roughly 11 years. At the solar cycle's peak (solar max), the sun has the highest number of sunspots. These sunspots are the birthplace for radiation that hits the earth. As the magnetic fields in the spots become tangled and release energy in the form of a flare, matter is expelled. This matter hits the earth's magnetic field and causes the effects that concern the safety community.

Why are we concerned about space weather? The effects of solar storms can be felt in manned and unmanned space vehicles, links used to communicate with terrestrial and space objects, as well as ground power systems. Some of the most serious effects of solar weather include loss of communication and navigation satellites, degraded ability to communicate with aircraft via any form of radio and power grids going offline.

For the manned space segment, astronauts can be injured from high radiation levels and equipment can be damaged on the ISS. Unmanned spacecraft can have their life substantially shortened due to solar cell degradation, or cease to be useful as a result of equipment failure, e.g., Galaxy 15, aka Zombie Sat. Signal attenuation can lead to a loss of commanding the space segment, as well as a loss of radio communication. This can effectively bring command and control to a halt on a battle field. Ground power systems can pick up excess current in the atmosphere which can overload a system causing massive equipment failures and loss of power for a prolonged period of time.

The sun is currently in solar cycle 24. Over the next four to five years, the earth will experience elevated levels of solar radiation. This cycle is predicted to be less energetic than those in recent past; however, you can't mistake frequency of events for ferocity of those events. There is no correlation between the two. Even if we only have one solar flare that affects us over that time (which is highly unlikely), it could be large enough to cripple a majority of our satellites and destroy power grids. In fact, a recent solar flare erupted that was as high as two

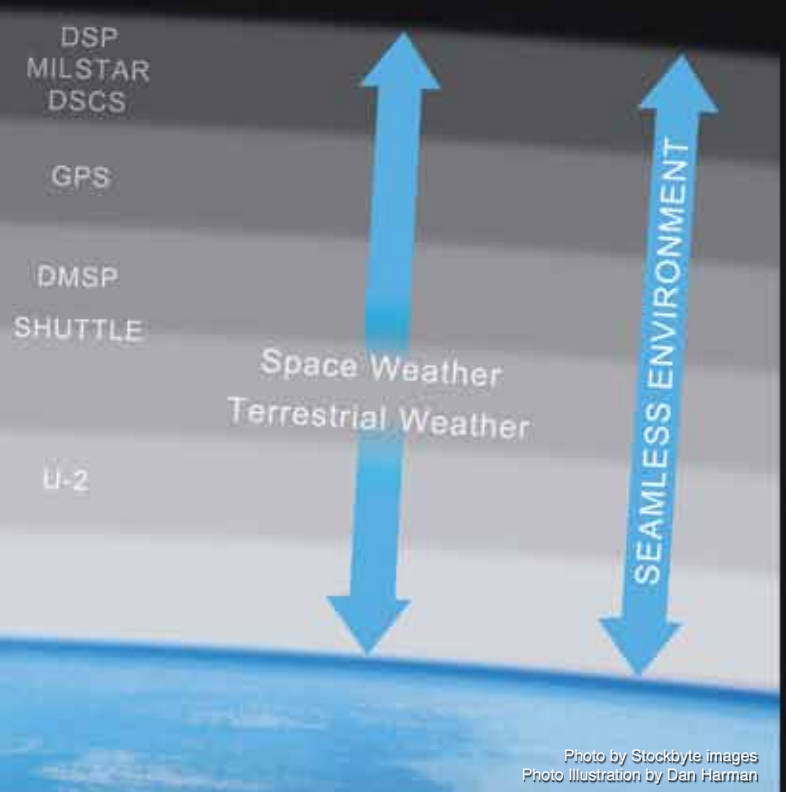

Photo by Stockbyte images
Photo Illustration by Dan Harman

times the distance from the earth to the moon!

What can you do to protect our assets? First, you need to know and understand the limits of your equipment. If it's at risk over a certain level or radiation, then you need to plan for what you'll do when that big storm comes. You can exercise in a "comm out" environment and pull out the maps to get to where you're going rather than rely on GPS.

You can also monitor the solar weather yourself to get the most lead time possible before en event. There are many excellent solar weather resources, and yes, there is an app for that! A few Internet resources include the National Weather Service's Space Weather Prediction Center (http://www.swpc.noaa.gov/index.html), Utah State University's Space Weather Center (https://spaceweather.usu.edu/htm/innovations/space-wx-iphone-application) and the Air Force Weather Agency (https://weather.afwa.af.mil/jaawin/space/main.jsp).

In the next few issues, we'll look at some historic examples of solar weather effects to learn what has happened in the past. Then we'll discuss what the safety community can do to protect our warfighting capabilities in any environment. Lastly, we'll look ahead at technologies to help us better predict solar occurrences.

Just remember those astronauts in the ISS. They live with a constant awareness of space weather and its effects. The safety community could greatly benefit from the same level of awareness.

Wingman Magazine Wins Awards

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Photos by Dennis Spotts
Photo Illustration by Dan Harman

Wingman magazine recently collected five MarCom awards — two platinums, two golds and one honorable mention — for outstanding achievement by marketing and communications professionals.

We're proud to say our Wingman successfully competed with entries from corporate marketing and communication departments, advertising agencies, public relations firms, design shops, production companies and freelancers. According to the award-notification letter, the competition "has grown to perhaps the largest of its kind in the world."

Winners ranged from individuals to media conglomerates and Fortune 500 companies. Of the almost 5,000 entries from throughout the U.S. and several foreign countries, the 2010 Wingman winners' works are:

"Analog Leadership" — written by Master Sgt. Bryan Valdez (Summer 2010) — Platinum

"Birds Don't Fly at Night" — designed by Dennis Spotts (Fall 2009) — Honorable Mention

"Car Seat Obsession" — written by Maj. Rodger Nelson (Fall 2010) — Gold

"Summer 2010 Wingman Magazine" — Gold

"What's in Earth Orbit?" — designed by Dennis Spotts (Winter 2010) — Platinum

The MarCom's Platinum Award is presented to those entries judged to be among the most outstanding entries in the competition. Platinum winners are recognized for excellence in quality, creativity and resourcefulness. Platinum is awarded to approximately 15 percent of entries. Approximately 18 percent of nominations received the Gold Award, presented to those entries judged to exceed the high standards of the industry norm. Approximately 10 percent received Honorable Mentions, granted to those entries that meet the expectations of the judges.

We couldn't have won these awards without the support of many contributors. We give special thanks to the division Wingman representatives: Randy Rushworth, Sharon Rogers, Maj. Korensia Siford and Master Sgt. Joseph Fontenot.

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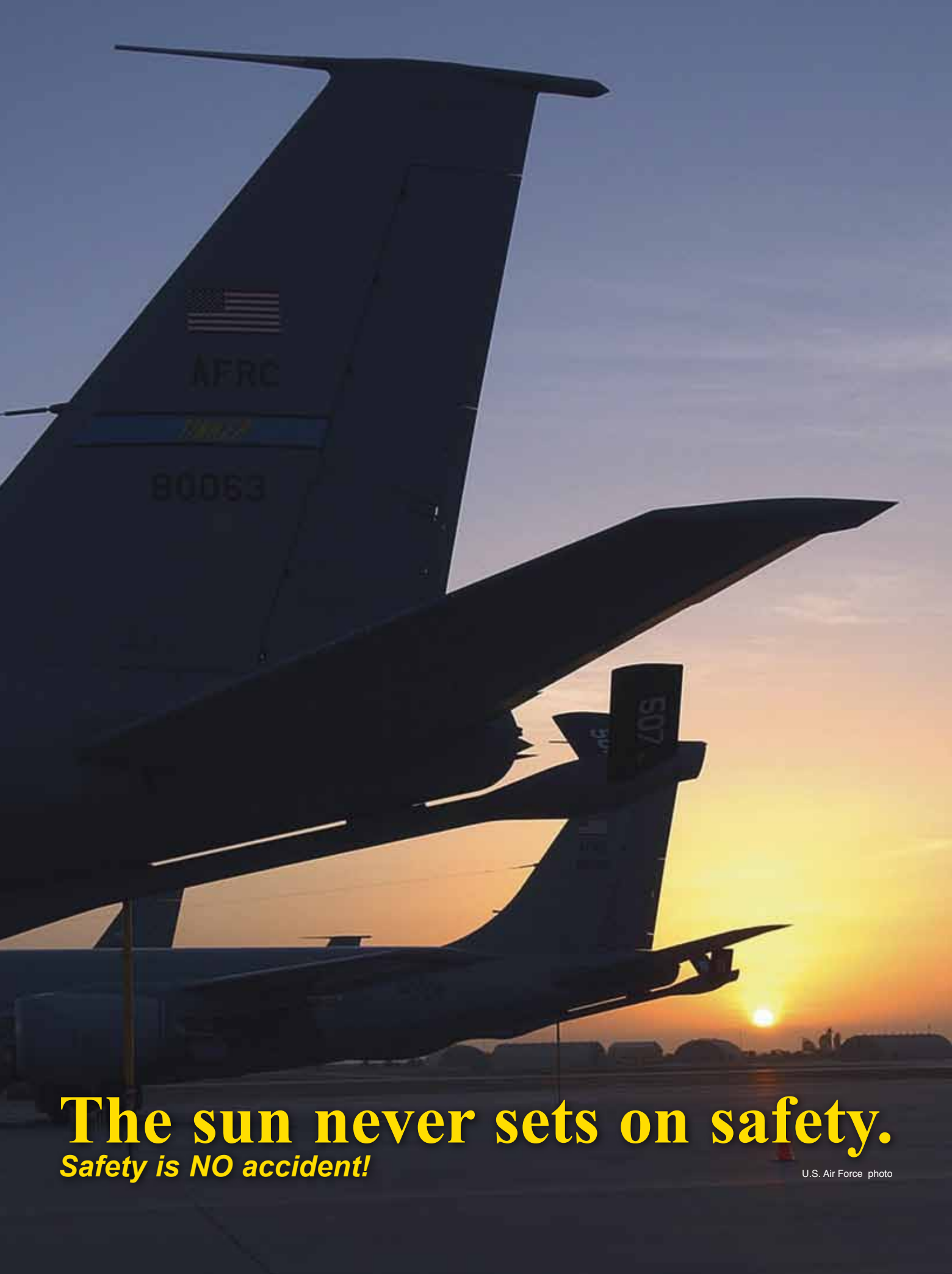

The sun never sets on safety.

Safety is NO accident!

U.S. Air Force photo