Volume 2, Number 3 Summer 2009

WINGMAN

Airmen Taking Care Of Airmen

The United States Air Force Journal of Occupational, Operational and Off-Duty Safety

Joint Services Summer Safety Campaign
Spotlight on Ground Safety
Inspect-O-Grams
Back to Basics with System Safety
The Weakest Link

Volume 2, Number 3 Summer 2009

WINGMAN

Airmen Taking Care Of Airmen

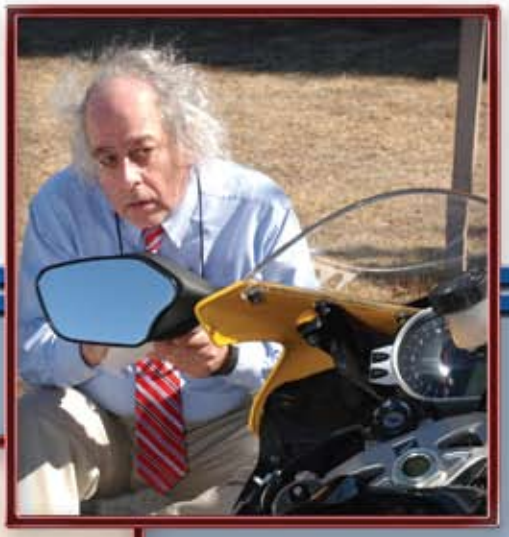
The United States Air Force Journal of Occupational, Operational and Off-Duty Safety

Commercial prefix (505) 846-XXXX
Wingman is online at *http://afsafety.af.mil*

PURPOSE—The Air Force Safety Center publishes *Wingman* quarterly, as part of the program to prevent mishaps. Contents are not directive unless so stated. REPRINTS—Air Force units may reprint *Wingman* articles without further authorization. Other organizations must advise the editor of the intended use before reprinting. This coordination will ensure that articles are accurate and contain the most current information. The appearance of specific commercial products, commodities or services is for information purposes only and does not imply Air Force endorsement. Some individuals in this publication are not Air Force members and may not conform to Air Force appearance standards. To establish or change requirements, Air Force units must contact *afsc.semm@kirtland.af.mil,* Voice—DSN 246-1983; Fax—DSN 246-0931 or by mail:

Wingman
HQ Air Force Safety Center
9700 G Avenue SE, Ste 282 B
Kirtland AFB, NM 87117-5670

GROUND



WEAPONS

SPACE

AVIATION

Features

Ground

Weapons

Space

Aviation

Front cover: Photo courtesy of Kawasaki Motor Corp.
Front cover by Felicia M. Hall

POSTAL INFORMATION—*Wingman* (ISSN 1055-7725) is published quarterly by HQ AFSC/SEM, 9700 G Avenue SE, Kirtland AFB, NM 87117-5670. Periodicals postage paid at Albuquerque, NM, and additional mailing offices. POSTMASTER: Send address changes to *Wingman,* Attn: Executive Assistant, HQ AFSC/SEM, 9700 G Avenue SE, Kirtland AFB, NM 87117-5670.

CONTRIBUTIONS & FEEDBACK—*Wingman* welcomes reader contributions, comments and constructive criticism. The editor may revise contributed material to improve clarity, while retaining the author's intended meaning.

To discuss your story idea, contact the managing editor by telephone, e-mail or fax.

Commercial telephone: (505) 846-0983
DSN 246-0983
E-mail—*afsc.semm@kirtland.af.mil*
24-hour fax: DSN 246-0931

Summer: Fun in the Sun During the Critical Days

MAJ. GEN. FREDERICK ROGGERO
Air Force Chief of Safety and
Commander, Air Force Safety Center
Kirtland AFB, N.M.

The season of sun and fun brings the "Critical Days of Summer" safety campaign, when the Air Force strives to keep all Airmen alive through a perilous 15-week stretch of increased travel and outdoor activity. A short online video presentation on the subject is available at *http://afsafety.af.mil/, http://www.afsc.af.mil/*, and on the Air Force Portal at *https://www.my.af.mil*.

In the summer, our kids are out of school, so we take leave and hit the road for recreation and family vacations. Additionally, many Airmen make PCS moves at this time of year. All that time in our cars increases our exposure to the most dangerous environment we operate in – traffic. The Air Force loses more people in vehicle fatalities every year than from any other cause – including combat. Each death is a terrible loss to their friends and families, and to their squadrons, as well.

That harsh reality drives our enhanced focus on vehicle safety. Every Airman is a valuable asset to the service and the nation, contributing energy and expertise to the global fight we're in. That means every Airman is a resource we must protect from risk in all its forms.

As always, this edition of ***Wingman*** offers information from the Air Force Safety Center's four disciplines to help keep you from harm while you work, travel, and play. We also recognize the 2008 annual safety award winners in these pages, as well as some exceptional aviators.

The Ground Safety Division leads off with a feature on how the pros in that arena support the Air Force mission. Then we explain the purpose and goals of the DoD Joint Summer Safety Campaign. Two other items are on motorcycling, and one responds to a reader's automotive question. Another article lists the do's and don'ts of hiking. The "Snapshot on Safety" recounts some Airmen's unfortunate mishaps. Wrapping up the segment is the Coast Guard's advice on safely operating personal watercraft. Note: The material in this section only applies to those who spend at least some time on the ground. If that doesn't apply to you, feel free to skip ahead.

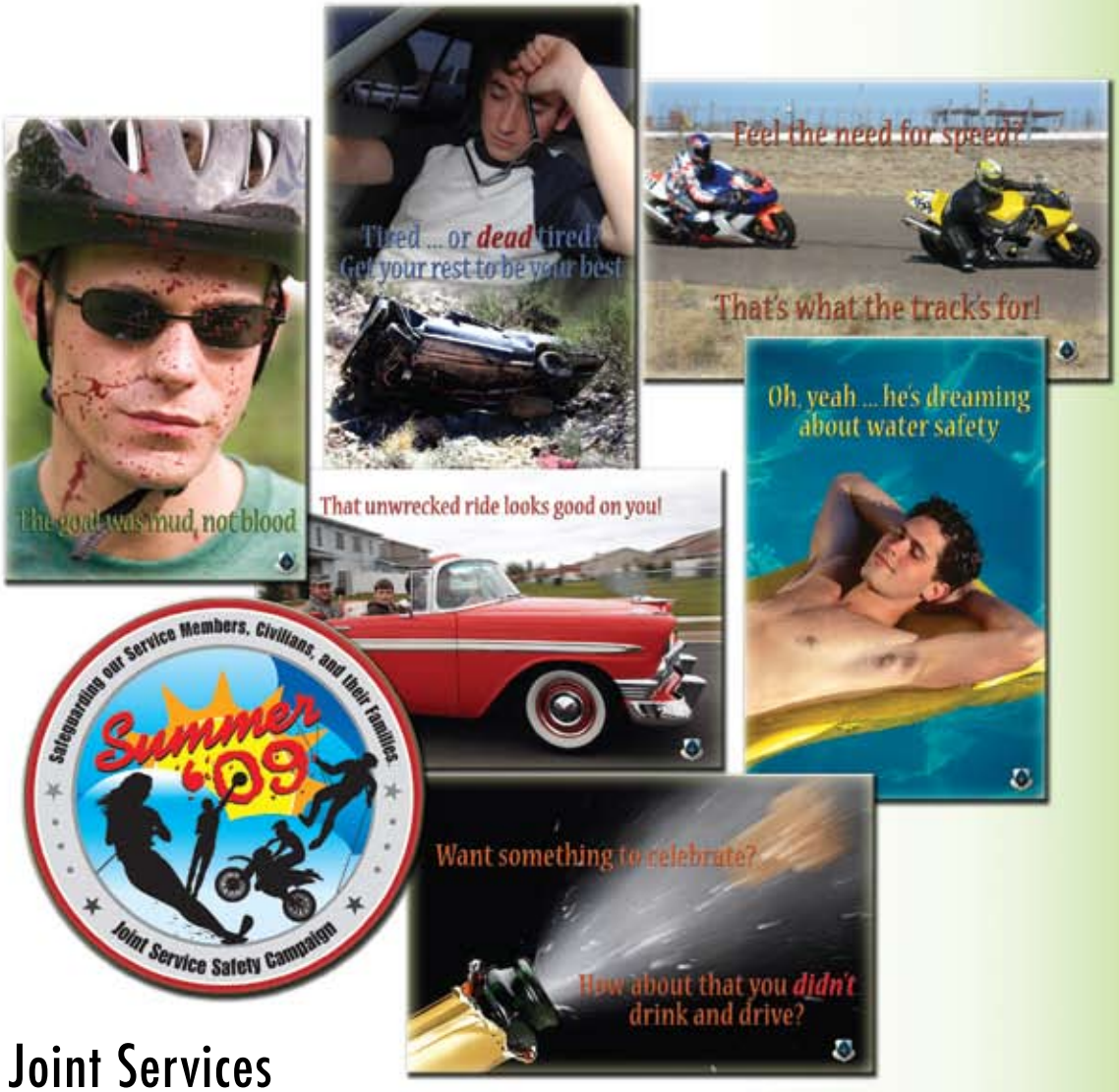
The Weapons Safety Division highlights the results of recent nuclear surety inspections in "Inspect-O-Grams." Learn the noteworthy history of Air Force small arms training in "Spotlight on Security." Concluding SEW's section is a thorough explanation of the requirements for gaining approval to remediate areas on the Military Munitions Response Program cleanup list.

The Space Safety Division contributes features on system safety, reporting Class E events, the potential "impact" of space debris, and a report on issues raised by the collision of the Iridium communications satellite with a Russian counterpart.

The Aviation Safety Division focuses on deployed operations, among other topics. For an Air Force at war, there's no more important subject. Also in that section is a collection of aviation-mishap statistics.

Finally, please let us know what you think of ***Wingman***. Fill out and return the reader feedback form on pages 27 and 28 or use the online form at *http://afsafety.af.mil/SEMM/pdf/Wingman/WingmanReaderFeedback.pdf*. The magazine staff and Safety Center leadership will review and consider all reader comments. ★★

HQ AFSC photo by Dennis Spotts



DoD Joint Services Summer Safety Campaign

22 May 09 – 7 Sep 09

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

Summer is a time to relax and enjoy fun in the sun. It's also a time of increased risk for Airmen who are traveling and involved in recreation. Traditionally, the military services experience most of the year's fatal mishaps during the summer. Managing risk effectively can make the difference between coming back to work safely and winding up as another statistic.

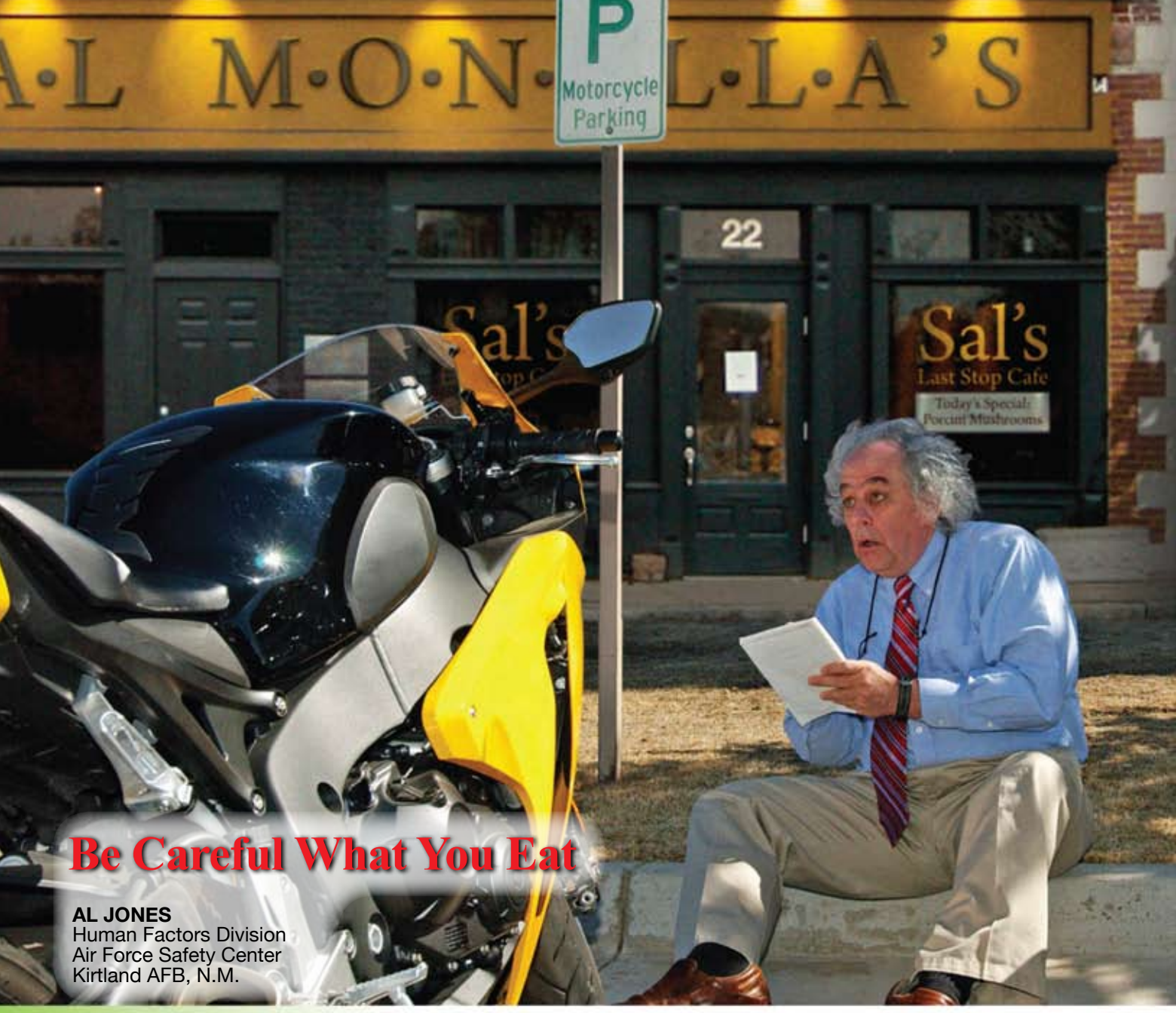
To combine resources and enhance cooperation, the U.S. military services are conducting joint seasonal safety campaigns. The Joint Service Summer Safety Campaign runs through Labor Day. The Air Force Safety Center, Army Combat Readiness/Safety Center, and Naval Safety Center, along with other agencies, teamed up to provide service members, civilian employees, and their families with resources to help them stay safe on the road, at home, and during off-duty activities.

The campaign features information on the following topics: Car and motorcycle safety, especially speed and seat belt use; sports and recreation, especially drownings; fatigue; and alcohol awareness.

The multiple goals of the campaign are: to share lessons learned and best practices among the services; focus on targeted mishap-prevention areas; continue education on specific hazards; and provide tools to help the DoD community make good risk-management decisions. It also aims to reduce deaths related to cars and motorcycles.

Each service's safety Web site will contain resources, such as videos, presentations, articles, and posters, that leaders can use during commander's calls, wingman days, and safety briefings. The sites will provide material to educate people about common risks. The tools will be updated throughout the summer, so check the site often, along with the links to other resources.

The Air Force's site is *http://afsafety.af.mil/SEG/SEG/Safety_Campaigns_Page.shtml*.



Be Careful What You Eat

AL JONES
Human Factors Division
Air Force Safety Center
Kirtland AFB, N.M.

Editor's note: Recently, several Safety Center colleagues went to lunch at a hole-in-the-wall café that had just opened near our building. Al Jones consumed a strange-looking side order of mushrooms, and the next thing we knew, he was outside interviewing a Honda CBR 1000 motorcycle. It was a curious sight ... Al outside taking notes as he talked to a parked, driverless motorcycle. We needed a motorcycle story for this edition, so we grabbed his notebook. What follows is his interview with a Honda CBR 1000, which Al referred to as "SB" in his notes. We believe that stands for "Sport Bike."

AJ: Pardon me. I'm with Manley Man Motorcycle magazine, and you look like a bike that would indeed attract a "Manley" man.

SB: Guilty. I'm a Honda CBR 1000, one of the sportiest bikes available.

AJ: Ahhh … one of those sexy sport bikes. You guys are the latest rage. People really seem to love you. What's the attraction?

SB: What's not to like? I've got it all. I'm sleek and cool. I've got class and style. Most of all, I've got speed.

AJ: No doubt you're riding a wave of popularity. You lead the pack on the sales floor; however, isn't it true that you also lead the way in accidents? Some folks seem to handle you well, but what about the young person who falls head over heels for you and picks you as his first bike?

SB: Hey, I ain't no mo-ped. I am what I am, and I don't discriminate. If you have 25 years' experience riding or 25 minutes' experience … when you push me full-throttle, we're going full-throttle, baby. Not my fault. This is not like Harry Potter choosing a wand.

AJ: "Harry Potter choosing a wand?"

SB: Yeah, you know. Harry is trying to choose a wand, and the store owner tells him, "You don't choose the wand; the wand chooses you." Man, you've got to get out more. Are you too cheap to go to the movies?

HQ AFSC photos by Dennis Spotts
Photo illustrations by Dan Harman

Anyway, the point is the bike *doesn't* choose you. You choose the bike. The human decides which bike to buy. If you start out buying a bike that's too powerful for your experience level, you may be asking for trouble.

AJ: OK, maybe there is some human blame for motorcycle accidents. There's no human here right now, so I have to ask you this question: What's the deal with going around curves? Isn't that the way you seem to kill most people?

SB: Hey, don't try to lay that guilt trip on me. I am absolutely built to safely go around any curve out there. I have two built-in devices called "brakes." **BRAKES, BRAKES, BRAKES**. Squeeze the hand brake and press down on the foot brake. They're both on the right side. It's not rocket science, people. That's all my human has to do to slow down.

In the middle of a curve is a pretty sorry time to realize you need to slow down. Humans need to think … use their brains. The time to slow down is when you approach a curve. Give me a break. Take action before getting in trouble. Try a little prevention.

AJ: Boy, someone has an attitude.

SB: I'm sick and tired of everyone blaming me. I've lost plenty of my fellow bikes because stupid humans won't slow down. Motorcycles don't kill people … people kill people. Me and my kind are the victims here.

AJ: OK, I didn't mean to be insensitive. Are those … tears?

SB: No, I just have something in my headlights. Everyone wants to blame the bike, but we don't make, or fail to make, the critical decisions. The phrase is called "human factors," after all, not "bike factors." Humans decide to buy bikes they're not qualified to ride, humans decide to ride before completing a motorcycle safety course, humans decide to ride without proper safety equipment, humans decide to drink and drive, and humans decide to speed.

AJ: Humans will read this interview, too. What do you want them to know?

SB: All the decisions I've talked about are important, but if I can leave you with three thoughts, they would be:

SLOW DOWN WHEN GOING AROUND CURVES

SLOW DOWN WHEN GOING AROUND CURVES

SLOW DOWN WHEN GOING AROUND CURVES

AJ: Good advice. Sometimes we humans just get caught up in the ride and don't use our brains. I know when I'm sailing down the road on my scooter, I find myself …

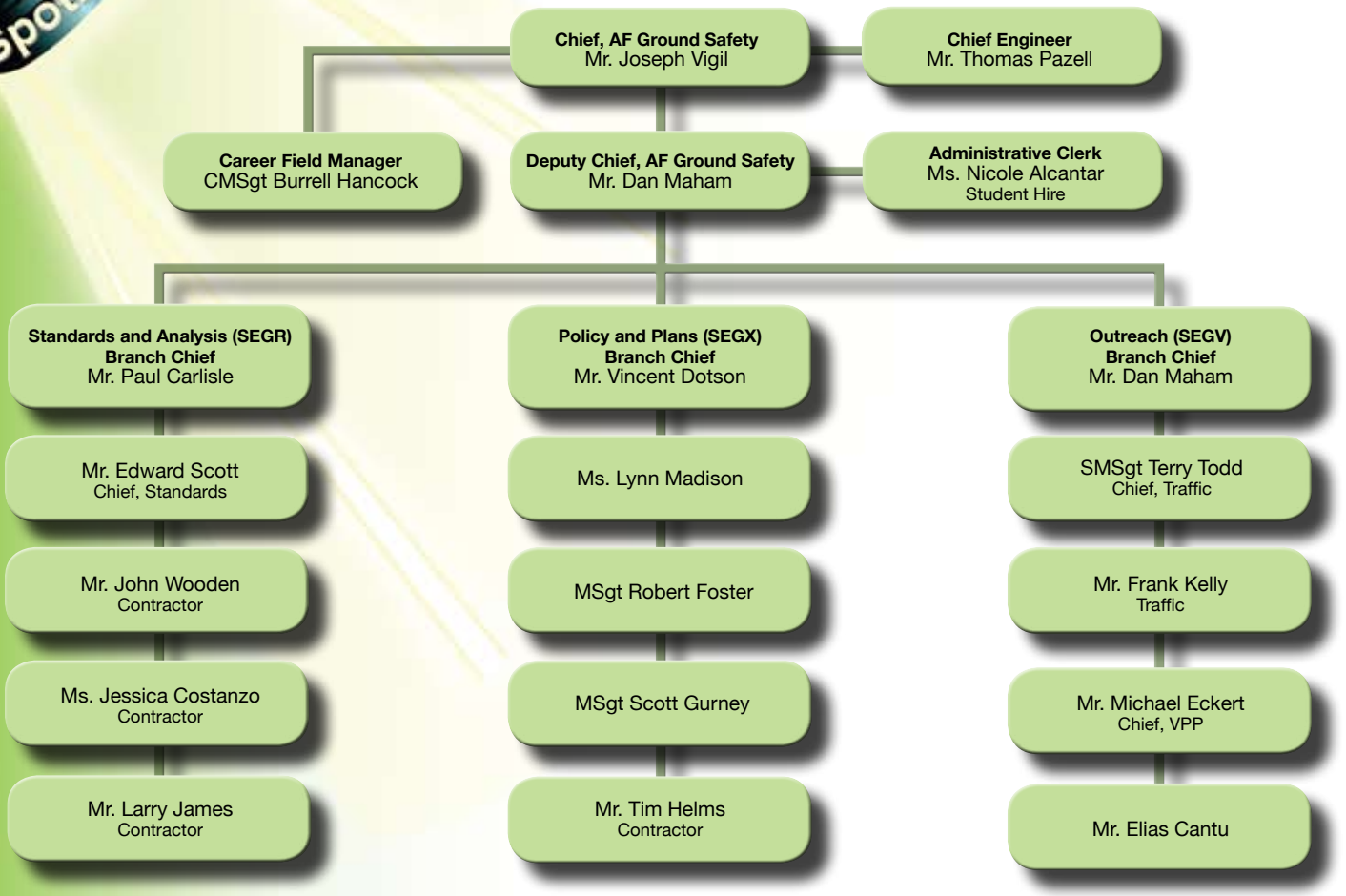
SB: Whoa, whoa, whoa … you've got to be kidding. A *scooter*? You ride it in public? There's no way you work for Manley Man Motorcycle magazine. You're nothing but a little scooter princess. A little wiener boy.

Editor's note: At that point, Al just snapped. He reared back and engaged in a one-sided slap fight, slapping that bike like there was no tomorrow. Unfortunately for Al, the 6-foot-7-inch, 285-pound owner of the bike walked up just as the merciless slap fight began. The interview ended shortly thereafter.

Epilogue: Since we were at the emergency room anyway, we had the doctor pump Al's stomach. The doc said Al should be fully recovered in a few weeks. Most people who've seen him agree that the broken nose actually adds an element of character to his face, anyway.

The Ground Safety Division

Organizational Chart



The Air Force Safety Center's Ground Safety Division provides premier mishap-prevention strategies, techniques, and tools to aid Airmen in mitigating risk, to prevent injury and property damage. Our job is to help you make your job safer, and we take this task to heart with everything we do. From developing and publishing safety directives to answering technical questions on safety issues, your safety and the Air Force mission are our combined No. 1 concern. We're forging ahead in mishap prevention to help preserve full-spectrum combat capability for the Air Force.

The Ground Safety Division is ensuring that much-needed and awaited guidance is implemented. We've made progress on the publications that matter to you, and to the health and welfare of every member of our elite family. Currently, we're working to provide you with the most up-to-date guidance on AFI 91-202, *The US Air Force Mishap Prevention Program*; AFPAM 91-210, *Contract Safety*; AFPAM 91-216, *USAF Safety Deployment and Contingency Pamphlet*; AFMAN 91-224, *Ground Safety Investigations and Reports*; and the new safety bible, AFI 91-203, *Air Force Occupational and Environmental Safety, Fire Prevention and Health Instruction.* Additionally, our safety operations staff responds to more than 400 safety inquiries/field requests per year, answering the safety concerns of the Air Force community in a timely manner.

Air Force people face a multitude of safety issues each day. Every Airman is a precious resource who requires the best safety education, training, and support we can provide. We're committed to building on the successes of the past and enhancing our existing programs for a proactive, comprehensive safety approach. From hot-button topics, such as fall protection and VPP, to everyday concerns, such as traffic safety, we're working for you — to promote a risk-management culture, to ensure safe work environments, and to provide our Air Force with the proper guidance to accomplish the mission without incident, so we all make it home safely … every day!

Ask Mr. Safety

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

Editor's note: In this feature, we answer readers' safety-related questions.

Q: Dear Mr. Safety:

As a regular reader of ***Wingman***, I have to say you all are doing a great job. I'm always eager to see the pearls of wisdom you put in every issue. I'm writing to you because I hope you can help me resolve a disagreement I've been having with my wife. We're planning a cross-country vacation this summer, but we can't seem to agree on the mode of travel. My wife thinks we should fly to our destination, while I think we should drive. She says air travel is the fastest and safest way to go, whereas I believe driving will provide an unbeatable bonding experience that will draw us even closer together than we already are.

I've worked the whole thing out in great detail. Under my plan, we'll travel in style, cruising in a classic automobile. I've explained to her time and again that my 1985 Yugo GV is a rolling work of art and a marvel of European engineering. She knows that heads will turn when they see us zip by in that sweet ride. My uncle Gus was the original owner of that low-mileage little cream puff, and it's always been garaged. Sure, it may not have all the fancy extras she has in her car, like a navigation system, air conditioning, a radio, comfortable seats, a reliable engine, or a smooth ride, but it does have our personalized cup holders that the kids gave us for our anniversary. All she has to do to roll down her window is use the vise-grips the way I've shown her. I even promised her we could stop and see the world's second-largest ball of twine. Honestly, I don't know what else she could possibly want. Women are so complicated! Even after all the years we've been married, sometimes I still don't understand her.

Please help us settle this dispute so we can get back to the state of wedded bliss we used to enjoy.

Sincerely,

Driving Enthusiast

A: Dear Driving Enthusiast:

Thanks for the kind words. We're happy to do our part to help readers everywhere resolve their safety issues. Yours is a special challenge, though. We don't often receive questions of an auto/marital nature, and we appreciate the opportunity to branch out.

Summer brings Independence Day, when Americans' thoughts turn to patriotic words and images from our history. A phrase from the Preamble to the Constitution fits your situation. In the interest of "domestic tranquility," our advice is to appease your wife and fly to your destination. Leave the Yugo in the garage for now. That mechanical marvel is far too special to be put at risk by the many unmerciful hazards out there on the roads. Save that little beauty for a local car show, where fans will appreciate the unique character of an automotive icon.

Besides, think of the points you'll score by giving in this time. She'll owe you one, and later, when you really need a bailout from an adverse situation, you'll be able to cash in that chip. Trust us on this one; we've been there, and it sure comes in handy to have such a valuable item available when you really need it. We wish you the best of luck in reaching your vacation site safely, and in reaching your next anniversary happily.

The Perils of Hiking

BOB BAKER
Analysis & Integration Division
Air Force Safety Center
Kirtland AFB, N.M.

U.S. Air Force photo by Tech. Sgt. Angela Clemens

Editor's note: *As a member of Albuquerque's Cibola Search and Rescue Team and the New Mexico Search and Rescue Support Team, Bob Baker has participated in more than 70 rescues. In conjunction with the New Mexico State Police, he works as a SAR operations section chief, running the tactical SAR field work, and is one of five field coordinators who function as SAR incident commanders for NMSP. His district covers 5,000 square miles of wilderness. In his day job, the retired Air Force major works as the Air Force Safety Center's Analysis Branch Chief and System Safety Chief.*

Saturday dawns bright, clear, and cool ... not a cloud in the sky ... perfect for a hike in the mountains. After taking care of a few morning chores and stopping by the bank for some fun money, you hit the trail at about 10 a.m. The trail is beautiful, taking you to a world few have discovered ... at least this weekend. You take breaks every 30 minutes or so, nibble trail mix, and drink some soda along the way. Around noon, you find a perfect little lake to have lunch and a short nap. After all, you've hiked three or four miles and gained a few thousand feet in elevation. You lay back, take in the cute puffy clouds floating along, and although the sun is still up, you notice the temperature has dropped. The clouds promise to keep you in the shade as you hike back to the car.

Strange … you don't quite remember that large boulder group over there ... maybe you passed it, but were looking in the other direction. The trees just don't look right either, and the trail doesn't look like the one you hiked in on.

By now, the clouds have completely obscured the sky, and to top it off, it's starting to drizzle. You cling to the hope that if you just go another 15 minutes, you'll recognize the terrain and find your way out. With a deepening sense of concern and anxiety, you plod on, only to find that you don't recognize the trail. You think that getting a little altitude might help you see the landscape better, so you start off-trail toward that small peak, just over there. It must be only a quarter-mile away.

After climbing for another 30 minutes, you don't feel like you've made any progress in getting to that little peak. As you crest the ridgeline, you have the sinking realization that the "little peak" is much taller than you thought, and is really another mile

U.S. Air Force background photo by 1st Lt. Shannon Nyberg
Photo illustration by Dan Harman

U.S. Air Force photo by Tech. Sgt. Chad Watts

U.S. Air Force photo by Bob Baker

away, at least. By now, the sun — if you could see it through the clouds — is getting low on the horizon. You know you need to find the trail, because it's the closest thing passing for civilization.

"Aw, s#!+!" you think, as the realization hits that you don't see the trail you'd followed to the ridge. If only you'd told someone where you'd be hiking before you rushed out this morning!

Full-scale panic is setting in as daylight fades and darkness begins to swallow the landscape. To make matters worse, the simple climb to the ridgeline now looks extremely treacherous ... especially in the dark. In despair, you admit that you're lost. Clinging to your only hope, you pull out the cell phone you wisely charged this morning. Ugh! Only one signal strength and battery bar left. It was fully charged at lunchtime — it *has* to work.

You dial 911, and over the next two minutes, you tell the operator your predicament. Then the cell phone dies and the cold realization hits that you're all alone. Not another person within three miles. If only you could build a fire, or at least get warm ... your damp clothes don't help. Hours pass as you ponder your fate ... will it be hypothermia, starvation, dehydration, or critters that claim you?

After what seems like 15 hours, you hear voices and whistles in the distance — you call at the top of your lungs until you can't speak anymore. Then you hear nothing except the wind that's picked up. Despair engulfs you again.

Unfortunately, the situation described above happens all too frequently. While the story is fictional, every element comes from search and rescue missions in the mountains of New Mexico. If only the ill-fated protagonist in that story had the following 10 essentials, things may have gone much better:

1. Extra clothing, including hat and gloves — Provides extra warmth and potentially some dry clothes for changing into when one gets damp and, in general, provides protection from the elements.

2. Extra food and water — Provides sustenance should an emergency arise, and can help others who've found themselves in trouble. I've shared my water surplus many times with those who've run out.

3. Whistle — One of the most important items you can carry in the wilderness. Voices don't carry very far, especially in windy conditions. Whistles can be heard from much longer distances and for a longer time.

4. Flashlight and extra batteries — Excellent for lighting your path if you're out after dark, and you can use it to signal rescue teams.

5. First-aid kit — This self-explanatory tool should be sufficient to provide for the hiker. It doesn't need to be a field surgical pack, but enough for one or two people. Many SAR responders supplement their first-aid kits with several feet of duct tape, which can provide bandages with a little extra adhesion or help hold splints in place.

6. Waterproof matches — Perfect for starting a fire for signaling and providing warmth. In addition, SAR responders often carry a magnesium fire-starter block, which is an excellent fire-starting tool. Many also carry a small container with material such as wood chips, lint, or cotton balls prepared with Vaseline, to serve as tinder.

7. Large plastic bag — May serve in several capacities. It can provide shelter in damp conditions or act as a sun shade. Additionally, you can use it as a poncho (tear holes for arms and head) or as a water barrier to cover an injury (best when used with duct tape).

8. Map — A topographical map is a great tool to keep from getting lost, as long as you know how to read and interpret the map's information. Using a map and compass is a skill you should practice frequently before your big hiking trip. SAR responders practice skills such as terrain identification, resection (triangulation), and cross-country navigation.

9. Compass — This tool works well when combined with topographical maps, but you can also use it in a stand-alone capacity. As with the topo map, users should be familiar with compasses and practice frequently to become proficient. SAR responders practice taking bearings, converting between true and magnetic bearings, and hiking using headings. Your local orienteering club is an excellent source for learning how to use your compass.

10. Knife — Perfect for cutting kindling and wood for signal fires, campfires, and shelters. You can use it to shave magnesium fire-starter blocks and to strike against flint to create fire. You can also use it to mark trails in an emergency.

In addition to packing the right hardware, observing some simple rules can help you avoid or overcome difficulties:

Don't hike alone. Hiking with a friend is an enjoyable way to share experiences, build memories, and take those "hero-shot" photos; more importantly, it helps provide safety for both hikers. If you get injured, help is as close as your buddy. The uninjured person can attend to first aid, call for help, and signal rescuers. Even better than hiking with one friend is hiking with three. Then if someone gets injured, one person can stay with the injured party and the other two can go for help — no one is left alone.

Tell people where you're going, how you're getting there (trail names/numbers or sketch a simple map), and when you'll be back. Follow the plan. Deviating can lead potential searchers to look in the wrong area. Develop a working knowledge of your routine hiking areas. Explore areas you frequently hike, and gradually expand your knowledge of the area.

Leave a clothing description and gear list with someone, so searchers will know what to look for and will have an idea of how long you can make it. Include a list of any required medicines and the timing of the last dose. This is especially important for people with diabetes, heart conditions, and many other life-threatening medical conditions.

Save your cell phone batteries. As you go deeper in the wilderness, your phone will ramp up its output power just to talk with a cell tower. As it does so, your battery drains quickly. Don't make unnecessary calls — doing so deprives rescuers of a good tool to locate you.

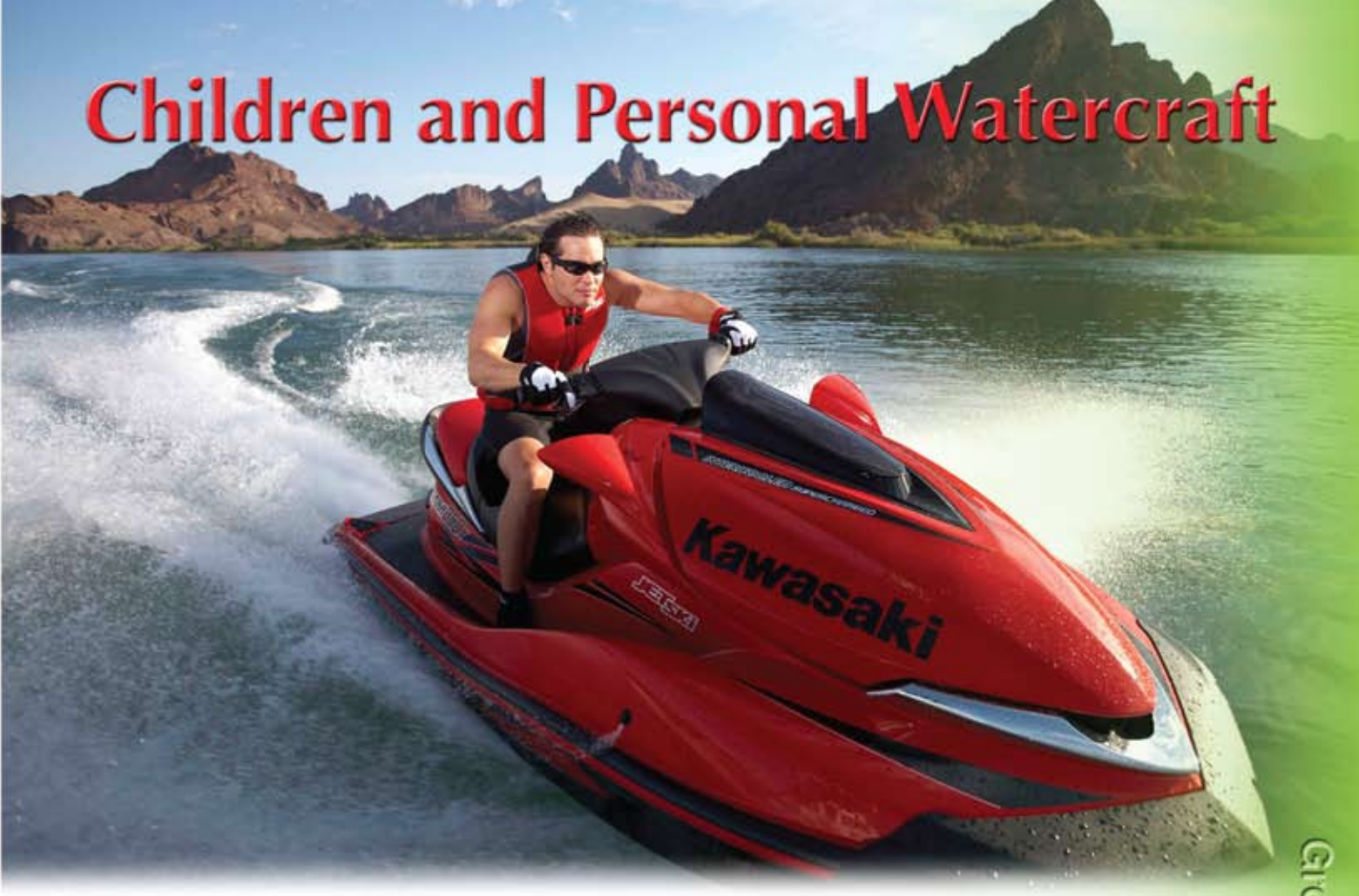
Keep an eye on the weather. Those puffy, friendly looking clouds can quickly turn threatening. Understand local conditions. In the mountains, clouds can build into thunderstorms within 15 minutes, complete with life-threatening lightning.

Learn outdoor survival skills through commercial or local organizations, such as orienteering, hiking, and camping clubs.

Practice sound risk management. Assess your skills and stay within them. Overestimating your abilities can lead to great peril. Learn from the experience of Aron Ralston, avid mountaineer and explorer, who in May 2003 found himself alone, trapped beneath a boulder in the Utah wilderness. To survive, he cut off his own right forearm with his knife, and then had to rappel and hike his way to civilization.

Being mentally and physically prepared, packing the right equipment, and following some common-sense rules will help you safely enjoy your time in the wilderness. Take the time to mitigate your risk and maximize your fun.

Children and Personal Watercraft



Ground

Be educated

- Take a boater education class with your children
- Be aware of all manufacturers' recommendations and local laws concerning use by children
- Always attach engine shut-off lanyard
- Never allow passengers to ride in front of the operator
- Always stay clear of intake grate and water jet
- Ensure your child understands a PWC is not a toy
- Scan constantly for people, objects, and other watercraft

National statistics

- In one year, 112 children under age 12 were injured on PWC
- Lack of experience and excessive speed caused 60 percent of the accidents when the operator was 12 or younger
- Collisions result in more injuries and deaths than any other type of PWC accident
- Most PWC accidents occur in the first 20 hours of operation
- 25 percent of these were operators in violation of state laws and manufacturers' recommendations
- 80 percent of these operators did not have formal training

"Too often we are seeing instances where an adult will rent a personal watercraft, and then family and friends operate it with little or no regard to age or boating education and training."

- Office of Boating Safety -
USCG

Who can ride?

- Manufacturers recommend personal watercraft operators be 16 years old. Check state laws
- Riders whose feet reach the footwell floor
- Those wearing appropriate equipment, including:
  - USCG-approved personal flotation device
  - A wetsuit bottom or clothing that provides an equivalent level of protection
- Those who are able to hold on to handholds or person in front of them

Find out more:

USCG
United States Coast Guard
Office of Boating Safety
www.uscgboating.org

NTSB
National Transportation Safety Board
www.ntsb.gov

NASBLA
National Association of State Boating Law Administrators
www.nasbla.org

NSBC
National Safe Boating Council
www.safeboatingcouncil.org

Photo courtesy of Kawasaki Motor Corp.

Guardsman Planned to Survive

MAJ. DEANN M. BARR
184th Intelligence Wing Public Affairs
McConnell AFB, Kan.

Sometimes, hidden in the folds of a seemingly really bad day, can be the best day of your life.

For Lt. Col. Hans Neidhardt of the Kansas Air National Guard, that day was April 15, 2008, when he rode his motorcycle to work.

Neidhardt left his rural Kansas home at 6:05 a.m. on a two-lane highway, planning to enjoy a 40-mile ride to McConnell Air Force Base. An avid motorcyclist since 1974, he automatically donned his full-face helmet, a heavy leather jacket and chaps, and leather gauntlet gloves. Just four miles from home, on a clear day and a dry road, a deer suddenly darted out of the brush and onto the road.

With only seconds to assess the situation, Neidhardt knew he had three options: first, to hit the animal head-on; second, to cut in front of the doe; or third, attempt to maneuver around her backside.

Neidhardt was extremely close to the deer when he chose the third option, mindful of the ditch on his right. The doe must have stopped suddenly, perhaps mesmerized by the motorcycle's headlights.

"Everything went silent. I started to see things frame by frame, in slow motion. I was doing 65 mph — the posted speed limit — when I saw the deer starting to cross the road. I was trying to maneuver instead of brake, so my speed at the point of impact was probably about 55 to 60 mph. Because there were no skid marks at the scene, I don't believe I ever used any braking, and I had very little time to come off the throttle, due to the deer's proximity. It seemed like an eternity, but the actual time was probably no more than a few seconds. I could see, feel, and hear the impact in slow motion. Then the bike started to shake violently, and I could no longer control it. I must have blacked out, because I don't remember going down. The last image I saw was the deer's haunch," Neidhardt said.

At about 6:20 a.m., a young man traveling east on the darkened road came upon the site, alerted only by the Yamaha 1100 V Star's headlights in the south ditch. After stopping to inspect the scene, the man saw Neidhardt unconscious on the pavement, about 200 yards from the initial impact site. Miraculously, he hadn't been run over by oncoming traffic while lying limp in the road. A large oil field truck had already driven past his unconscious form. The driver didn't stop because he thought the shape was just a black sleeping bag that had fallen out of a vehicle.

The first emergency responders suspected grave internal injuries when they saw only minor external bleeding. After further on-scene evaluation, Neidhardt was taken by ambulance to the regional trauma center, where he spent nine days recovering from his injuries.

"I had broken ribs, a collapsed lung, shattered shoulder blade, and broken collarbone. I only had five small spots of road rash on my hands. The minimized injuries were directly related to my safety gear," said Neidhardt.

Staff members at the Wesley Medical Center Trauma Team in Wichita, Kan., said most of

U.S. Air Force photo

their cases involve motor vehicle and motorcycle accidents, with motorcycles providing the most severe trauma.

More than likely, Neidhardt's protective gear saved his life. The deeply imbedded scratches on the helmet visor indicate he slid facedown for a considerable distance.

Although the left side of the bike doesn't have a scratch or dent, the handlebar and footrest are bent at a 90-degree angle.

"I still have a passion to ride. I did everything right and wore protective clothing. It's just one of those things that happen."

Neidhardt had taken the Beginning Riders Course at McConnell AFB in 1983, and enjoyed years of safe riding since then. He said all riders should begin this sport and hobby with the proper safety awareness.

"I encourage every motorcyclist to ride smart and safe — wear protective gear. You never know if or when you'll have to react to a dangerous situation. Remember, you're more exposed on two wheels than you are on four. If my story can influence just one person to ride more safely and wear the right gear, then the pain from my crash will have been worth it," he said.

"That came true almost immediately. The young man who found me lying on the highway that day stopped riding his new cycle until he purchased a helmet. Since then, I've told my story to anyone and everyone who'd listen, and several have rethought their riding practices."

Epilogue

In an update to his story, Neidhardt explained what's happened since his accident.

"My surgeon delayed my physical therapy program for regaining range of motion until mid-July, because she wanted my collarbone and shoulder blade to heal first. My first therapy session was July 25, 2008, and I completed the 68th one Feb. 6, 2009. My therapy sessions took 45 minutes each, going two or three times a week. The therapy included using an arm bike that you pedal with your arms, shoulder-range work with elastic bands, free weights and machines for strength, and stretching movements by the physical therapist. I still have a little limitation in reaching behind my back, but overall, my recovery has been outstanding, considering the injuries sustained.

"The first time I got back on a bike was in November, which amounted to about three laps around the house, staying in my yard and in first gear. My skills were very shaky. Being unsure of myself, I was concentrating on where the front wheel was while I was moving, not looking ahead to where I wanted to go.

"About a month later, I tried again, under the same scenario, but that time I was more at ease and was looking where I was going. I didn't want to get back on the highway until I felt capable of handling any road situation.

"I started to look for a new bike in late December, and took a 10-mile test drive Jan. 31. It felt good. The shop owner gave me a full-face helmet, riding jacket, and gloves for the test ride. My wife, son, and daughter-in-law didn't show it much, but they were very concerned. Time stood still for them when I hadn't returned as quickly as they thought I should have. I was taking it easy, because it was my first time at highway speeds and in traffic for more than nine months.

"I bought a 2009 Yamaha 950 touring bike Feb. 14, complete with new full-face helmet and protective riding jacket. My wife picked it up in mid-February, and we went for a short ride Feb. 22. It was great to be riding again.

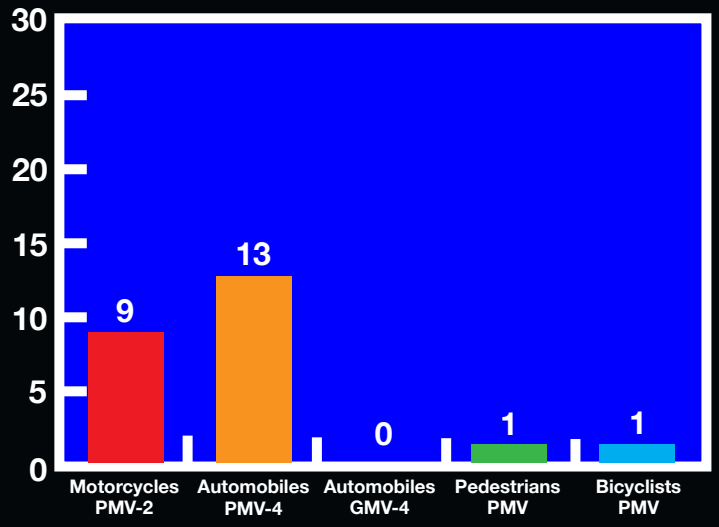
"I have to be honest about purchasing a bike and riding again. I don't fear riding, but there's still a little apprehension. What if it happens again? I'll take it one step at a time, complete with the right gear. I feel blessed to have been as fortunate as I was, and to be given this second chance to experience the passion of riding a motorcycle.

"If I ever experience another accident of that nature, I don't think there would be a third time. At 53, if I did have another accident of that type, given the seriousness of the injuries, I believe I wouldn't tempt fate a third time. As you get older, the recuperation time extends, and we never really know how much time we have left on this earth. Riding a motorcycle has its challenges and is a lot more unforgiving than an automobile. I love to ride, but if the time comes that I don't feel fully in control, then maybe it'll be time to hang up the helmet. I hope I'll never have to make that decision because of another accident. I hope I'll just grow too old to be able to handle a bike.

"That being said, I feel fine, and the 190th Air Refueling Wing Safety Office has replaced my reflective vest that was destroyed, so I'll be riding my new bike down the highway very soon," he said.

Wingman = Vigilance & Snapshot on

Motor Vehicle Fatalities
Total FY09 (As of Apr. 22)



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

Tunnel Vision

On a sunny spring day, an Airman was operating his new sport bike. He had been storing the motorcycle off base at a friend's apartment so he didn't have to take the mandated motorcycle safety training course. Friends said his riding skills were rudimentary and his demeanor cautious. He rode with "tunnel vision," focused on operating the motorcycle, because he was not confident in his ability to keep the bike on the road. He approached an intersection at the same time a civilian in a car was waiting to turn. The car proceeded into the intersection directly into his path. The Airman tried to stop, but struck the right side of the vehicle at 30 mph, resulting in fatal injuries. The car driver said that she never saw the motorcyclist and was cited for failing to yield right of way. The Airman was wearing all the proper personal protective equipment, and alcohol was not a factor in this mishap.

Lessons Learned:

The main factor in this mishap was the inattention of the car driver failing to see and yield the right of way to the Airman. She moved her vehicle into his path, leaving little or no time for him to react. There are, however, several other contributing factors to this mishap. Inexperience, lack of training, lack of confidence, fatigue, and lack of situational awareness on the Airman's part also contributed. The Air Force mandates riders take Motorcycle Safety Foundation training to improve their skills and abilities. The Airman showed poor risk management when he chose to avoid this training. The Airman also showed poor risk management when he chose to operate his bike with less than three hours sleep in the 48 hours before the mishap. While alcohol was not a factor, driving fatigued affects your reactions

Digital illustration by Felicia M. Hall

in much the same way as using alcohol. Seventeen to 19 hours without sleep equates to a blood alcohol content of 0.05, and 20 to 24 hours without sleep affects you like a BAC of 0.10 (legally intoxicated). Riding motorcycles is a wonderful pastime and a good stress reliever when you do it safely. Get your sleep, take the required training, practice your new skills in a safe environment, and watch out for other drivers, because they may not see you.

Out of the Blue

After graduating from a seven-week training course, three Airmen were returning to their home installation. The trip was more than 600 miles, and they were traveling in a government minivan. Along the route, they stopped several times to change drivers, refuel, and refresh. After the last stop, about 130 miles from their destination, the driver asked Airman 2 (front-seat passenger) and Airman 3 (rear-seat passenger) if they were "set," with seat belts on and ready to go. After receiving verbal confirmations, the driver proceeded along their route. After some time, a vehicle unexpectedly crossed the centerline and struck the minivan in the left rear passenger door, sending it out of control. While the driver tried to regain control, the minivan hit a guardrail, causing it to roll. Airman 3, who was not wearing his seat belt, was thrown around the interior of the vehicle and then ejected out the window. Airman 3 sustained severe closed head injuries and died a day later. The driver and Airman 2, who were wearing their restraints, sustained only minor injuries. Alcohol and lack of sleep were not factors in this mishap.

Lessons Learned:

A failure by Airman 3 to follow written policy about seat-belt use, and a failure by the driver to verify his passengers were indeed belted in, were factors in this mishap. You never know what may come out of the blue and affect you adversely. No one expects a vehicle to suddenly cross the centerline and strike their car. Are you prepared if it does? Air Force policy states that all occupants of government vehicles must wear their seat belts at all times. The driver and Airman 2 survived the mishap because they were belted in. Proper application of operational risk management by those involved may have prevented this tragedy. If you're not secured in your seat, you're a danger to yourself and others in an accident. Remember to buckle up. The life you save could be your own.

Early Morning Breakfast

After a late evening of socializing and drinking, four Airmen decided to drive from their base to town for breakfast. Rain made the roads wet. The driver lost control of the vehicle on an overpass, causing the vehicle to leave the road and roll. Passengers 1 and 2 were ejected. Passenger 1 sustained fatal injuries and passenger 2 sustained permanent critical injuries. The driver and passenger 3 received minor injuries. Alcohol was a factor in this mishap.

Lessons Learned:

The factors in this mishap included alcohol use, weather conditions, failure to use available safety devices, and failure to follow personal risk-management practices. For risk-management principles to work, they have to be addressed when the mind is clear. If you're drinking, be sure to travel with a nondrinking designated driver. If there's no designated driver, take a taxi, or don't go. It's been proven time and again that seat belts save lives — proven in this case because the two Airmen who were buckled up received only minor injuries, while the two not wearing seat belts sustained critical injuries.

Spotlight on Security

A Proud Heritage: Air Force Combat Arms

TECH. SGT. MERLE HUDSON
355th Security Forces Squadron
Davis-Monthan AFB, Ariz.

The Air Force of today is not the Air Force of 20 years ago. The service has evolved to be leaner, faster, and stronger than it has ever been. Although many things have changed over the years, one thing that hasn't changed is the need for weapons training for Airmen, although it wasn't realized until a tragedy occurred. Let's take a trip down memory lane and explore the history of the Combat Arms career field.

Before the Korean War (1950-53), no formal program of weapons training existed. One result was the inability of most Airmen assigned to Kimpo Air Base, Korea, to successfully defend themselves and the base. Most base weapons were inoperable due to lack of maintenance. The few serviceable ones were of little use as the troops weren't trained or able to even load or aim them. Only the Air Police were routinely trained in marksmanship and maintenance of small arms.

During the Korean War, several incidents called attention to the small arms training provided to Airmen. The most significant was the tragedy at Kimpo, which was overrun by a numerically superior Chinese communist force. The Air Police Squadron was so overwhelmed that its Airmen were forced to fight a rear-guard action before being annihilated. The general base population was then easily defeated before reinforcements arrived to drive the enemy back. Those the Chinese found alive were hanged in Kimpo's main hangar. That hangar still stands today as a memorial to those who died without a chance to fight.

The resulting investigation revealed serious deficiencies in the way small arms training was perceived and carried out in the Air Force. The experience of the Korean War encouraged the Air Force to pursue a course that would change the way the service provided weapons training.

In 1958, 25 experienced Air Force competitive shooters were selected to become the initial instructor cadre of the USAF Marksmanship Center at Lackland AFB, Texas. The marksmanship program was designed by Col. Tom Kelly, former commander of Holloman AFB, N.M., and was directed by Col. Peter W. Agnell. The initial cadre attended the U.S. Army's advanced rifle marksmanship coach's class at Fort Benning, Ga., from Jan. 26 to Feb. 15, 1958. The three-week training course included coaching techniques, range management, and procedures for preparing marksmanship-training programs. The purpose of the initial cadre was to train small arms instructors and gunsmiths for assignment to all Air Force bases. With those Airmen as a core, bases throughout the world began selecting staff to send

U.S. Air Force photos by Senior Airmen Julianne Showalter and Daniel Owen

to the center for training.

On Nov. 5, 1958, the first class began training 32 students. The graduates returned to their bases to establish local marksmanship programs. All new instructors were awarded the Air Force Specialty Code 753X0, and the expanded program included intensive training for aircrews, air police, and air base defenders, to improve the overall weapons capability of all Airmen.

With the increased need for weapons training and the ever-evolving Air Force mission, the career field made another change in 1965. The unit's name was formally changed to the Small Arms and Maintenance Unit. The change designated what weapons the career field was responsible to train. Besides meeting local training objectives and conducting competitive rifle and pistol matches, small-arms specialists set up and operated specialty courses.

The Air Force Sniper School at Fort Campbell, Ky., existed from 1965 to 1967. Its purpose was to train Airmen to carry out assigned duties effectively in the Republic of Vietnam. There was also a 72-hour Southeast Asia course in operation through 1971 to prepare all Airmen en route to that AOR.

In 1978, control of the marksmanship program moved from Washington, D.C. to Randolph AFB, Texas, to enhance program management.

The career field felt another change in 1982, when it was functionally restructured to report to the Air Force Office of Security Police. With this change came the redesignation to Combat Arms Training and Maintenance.

On Nov. 1, 1993, the AFSC was changed to more closely align the career field with the Security Police career field. The new designation was 3P1X1 for CATM instructors and 3P1X1A for gunsmiths. In the past few years, the career field has made another change. Instructors still fall under the same AFSC, but have dropped the "TM" from CATM and are referred to as Combat Arms. The career field teaches, inspects, and repairs weapons, including the M-16-A2 rifle, M-4 carbine, M-9 pistol, M-870 shotgun, M-203 grenade launcher, M-249 automatic rifle, M-240B machine gun, M-2 .50-caliber machine gun, and MK-19 automatic grenade launcher.

Since its inception, Combat Arms' main goal has been to instill within Airmen the knowledge, confidence, and skills to safely handle, care for, and operate the type of weapon they are assigned, so that they can protect themselves, others, and all assets under military control. It has been and always will be evolving because of the Air Force mission and the uncertain state of the world.

Focus on the front sight, and use a slow, steady trigger squeeze!

Combat Arms Instructor Creed

I am an Air Force Combat Arms Instructor.

My country's strength lies in the men and women I train and their weapons which I maintain.

My students hold faith and place great trust in me.

Their lives depend on my ability and their confidence in my integrity; for in a time of war, their talent will be needed.

They are to be treated with fairness and discretion, for my country's resources are entrusted to their watchful eye, and their survival is in my hands.

My students I MUST NOT FAIL, my students I WILL NOT FAIL.

For mine is a proud heritage and fostering it is my responsibility.

I am an Air Force Combat Arms Instructor.
"Ours is the Profession of Arms."

We train in peace, to prepare for war.

Explosive Safety Submissions

MIKE LAHOFF
Weapons Safety Division Contractor
Air Force Safety Center
Kirtland AFB, N.M.

Author's note: *Much of the information in this article comes from DoD 6055.09,* DoD Ammunition and Explosives Safety Standards*, Feb. 29, 2008.*

What would you think if the pond you've been swimming, boating, and fishing in for the last 20 years was suddenly declared off-limits because it's chock-full of 100-pound high-explosive general-purpose bombs and other dangerous explosive munitions? I'm sure you'd want your recreation area back.

Such is the predicament at New Boston Air Force Station, N.H. Joe English Pond, a heavily wooded former recreation area near Manchester, N.H., presents this problem. The pond, a former World War II bombing-practice target, and surrounding areas are on the Military Munitions Response Program cleanup list. In order to clean up the area, an approved plan is required. The plan required to clean up the area is called an "Explosive Safety Submission."

The discovery of what's called "material potentially presenting an explosive hazard" is a dangerous situation and is a primary entering argument for the remediation or cleanup of real property. Such discoveries may be the result of historical records reviews, an interview, a comprehensive site evaluation, migration of buried munitions, or construction that unearths a munition or explosive of concern. Among many means of discovery, MPPEH may be found by a hiker in a remote area on a formerly used defense site that may have been a World War II artillery or bombing range. It may also be in the pond you've been using for family outings.

The Department of Defense takes the protection of people and real property from explosives hazards seriously. DoD has established explosives safety standards to deal with the discovery of real property known or suspected to contain MPPEH. DoD publication 6055.09-STD establishes uniform safety standards for ammunition and explosives throughout their lifecycle. Those standards protect associated people and property, unrelated people and property, and the environment from the potential damaging effects of an accident involving ammunition and explosives.

U.S. Navy photo by Mass Communication Specialist 2nd Class Walter J. Pels

When a site is known or suspected to contain MPPEH and the decision is made to clean it up, then an approved plan to remediate the concern is required. This plan is satisfied in the form of an explosives safety submission or chemical safety submission. This article will deal primarily with the ESS.

An ESS ensures DoD and AF safety standards are followed during munitions responses when intrusive activities are planned. An ESS isn't required for clearance activities on operational ranges, unless addressing a military munitions burial site; munitions or explosives emergency responses; preliminary assessments or site inspections when intrusive activities are not intended; ranges used exclusively for training with small-arms ammunition (.50 caliber or less); on-call construction support; and anomaly-avoidance activities. After a rigorous review process via the MAJCOM and Air Force Safety Center, the ESS must be approved by the DoD Explosives Safety Board before any dirt is turned over.

When drafting an ESS, use DoD 6055.09, Chapter 12, paragraph C12.5.8, to get an ESS approved. In addition, the AFSC Web site, http://www.afsafety.af.mil, has a template that may also be used for ESS development. The template is a guide taken straight from the DoD standard. Both contain the specific sections needed to satisfy the requirements for a DDESB approval.

The ESS opens with a background section that briefly describes the reasons for the munitions response. This includes the scope of activities and any significant differences in responses that would occur as a result of the work being done. The ESS will also contain, as a minimum, maps of the area or areas where the munitions response is planned. It also will include minimum separation distance arcs for unintentional and intentional detonations for the munition with the greatest fragmentation distance in the response area. These MSDs and any other quantity-distance issues will be explained in the next section of the ESS, titled "Explosives Safety Quantity Distance."

After the ESQD section, outline the types of munitions and explosives of concern expected during munitions-response activities. Next, a start date is provided, followed by a section on MEC migration that describes naturally occurring phenomena that could result in future migration or exposure of MEC. After describing the MEC, thoroughly explain the required detection equipment and response techniques. In addition, outline equipment limitations and quality-control procedures for detecting munitions.

When MEC or munitions debris is identified, describe the process for disposing of it in the next section of the ESS. This is an explanation of how explosives safety requirements will be achieved during transportation, treatment, or disposal. After outlining procedures for disposition, the submission must address any environmental, ecological, and cultural considerations that may be affected by the munitions response. Then, address any technical support required, followed by an explanation of how residual risk will be managed. Essentially, residual-risk management refers to how the unit will implement land-use controls and handle long-term management as a result of the munitions activities.

The final sections of the ESS address methods to educate the public, a summary of stakeholder concerns, and how contingencies and unexpected discoveries will be handled. To obtain an approval, all sections must be included and thoroughly explained in the ESS. Depending on the responsiveness of the parties involved, the entire approval process should be completed within two months. In addition, references in the DoD standard to other DDESB or service documents are authorized when drafting an ESS. Of course, the conventional weapons safety branch staff is available to answer questions that arise during the development of an ESS.

If hazards, risks, or explosives safety controls differ or change during intrusive operations, then an amendment to the ESS must be submitted and approved by the DDESB before remediation activities continue. Corrections to an ESS, however, are typically administrative changes to the ESS that don't require DDESB approval, but should be sent to the MAJCOM and AFSC.

When the explosives safety aspects of the munitions response are complete, as outlined in the ESS, then an after-action report will be written and provided to the DDESB after the AFSC review. The AAR summarizes what kind of MEC, if any, was found, describes the effectiveness and limitations of technology used, contains maps of where the MEC was removed, summarizes land-use controls, and outlines provisions for long-term management.

The ESS is the capstone document in the cleanup of MPPEH known or suspected to exist on real property. The cleanup process outlined in this document is designed to protect all involved in the remediation work and all affected by it. The orderly and thorough process required to obtain approval of an ESS ensures the protection of people and real property from explosives hazards. It also ensures that a hiking area or former recreation area, as in the case of New Boston AFS, can be reopened for recreational use.

Air Force Announces 2008 Air Force Chief of Safety Awards

The Air Force's top safety officer has announced the recipients of the 2008 Air Force Chief of Safety Awards.

Safety Career Professional of the Year Award

Mr. Michael Matthews, 97th Air Mobility Wing
Altus AFB, Okla. (AETC)

Air Force Nuclear Surety Outstanding Achievement Award

Senior Master Sgt. Thaddeus Koslik
898th Munitions Support Squadron
Kirtland AFB, N.M. (AFMC)

Air Force Explosives Safety Outstanding Achievement Award

Senior Master Sgt. David Nyitrai
Headquarters Pacific Air Forces
Weapons Safety Division
Hickam AFB, Hawaii (PACAF)

Air Force Chief of Safety Outstanding Achievement Award for Ground Safety

Category I – 72nd Air Base Wing
Tinker AFB, Okla. (AFMC)

Category II – 62nd Airlift Wing
McChord AFB, Wash. (AMC)

Category III – 71st Flying Training Wing
Vance AFB, Okla. (AETC)

Category IV – 734th Air Mobility Squadron
Andersen AFB, Guam (AMC)

Category V – 23rd Space Operations Squadron
New Boston AFS, N.H. (AFSPC)

Air Force Chief of Safety Special Achievement Award

Maj. Michael Morman
22nd Operations Group
McConnell AFB, Kan. (AMC)

Air Force Chief of Safety Aircrew of Distinction Award

Aircrew of "Glide 51," 43rd Airlift Wing
Pope AFB, N.C. (AMC)

Capt. Mason MacGarvey
Capt. William Rodriguez
Capt. Kevin Stefanich
Staff Sgt. Nicholas Blackerby
Senior Airman Cravenkeo Khamone
Senior Airman Christopher Hunts

Air Force Chief of Safety Medical Achievement Award

Capt. Matthew Taranto
99th Aerospace Medicine Squadron
Nellis AFB, Nev. (ACC)

Air Force Directed Energy Weapons Safety Outstanding Achievement Award

417th Flight Test Squadron
Edwards AFB, Calif. (AFMC)

Flight Safety Plaques

ACC

4th Fighter Wing
Seymour Johnson AFB, N.C.

55th Wing
Offutt AFB, Neb.

55th Electronic Combat Group
Davis-Monthan AFB, Ariz.

20th Fighter Wing
Shaw AFB, S.C.

366th Fighter Wing
Mountain Home AFB, Idaho

AETC

45th Airlift Squadron
Keesler AFB, Miss.

50th Flying Training Squadron
Columbus AFB, Miss.

37th Flying Training Squadron
Columbus AFB, Miss.

99th Flying Training Squadron
Randolph AFB, Texas

48th Flying Training Squadron
Columbus AFB, Miss.

AFMC

75th Air Base Wing
Hill AFB, Utah

AFRC

315th Airlift Wing
Charleston AFB, S.C.

339th Flight Test Squadron
Robins AFB, Ga.

940th Air Refueling Wing
Beale AFB, Calif.

10th Flight Test Squadron
Tinker AFB, Okla.

Illustration by Dan Harman

AFSPC

45th Space Wing
Patrick AFB, Fla.

40th Helicopter Squadron
Malmstrom AFB, Mont.

AMC

89th Airlift Wing
Andrews AFB, Md.

311th Airlift Squadron
Peterson AFB, Colo.

317th Airlift Group
Dyess AFB, Texas

457th Airlift Squadron
Andrews AFB, Md.

22nd Airlift Squadron
Travis AFB, Calif.

22nd Air Refueling Wing
McConnell AFB, Kan.

62nd Airlift Wing
McChord AFB, Wash.

92nd Air Refueling Wing
Fairchild AFB, Wash.

375th Airlift Wing
Scott AFB, Ill.

ANG

122nd Fighter Wing
Fort Wayne, Ind.

132nd Fighter Wing
Des Moines, Iowa

148th Fighter Wing
Duluth, Minn.

189th Airlift Wing
Little Rock AFB, Ark.

PACAF

14th Fighter Squadron
Misawa AB, Japan

8th Fighter Wing
Kunsan AB, Korea

13th Fighter Squadron
Misawa AB, Japan

909th Air Refueling Squadron
Kadena AB, Japan

AFSOC

6th Special Operations Squadron
Hurlburt Field, Fla.

16th Special Operations Squadron
Hurlburt Field, Fla.

8th Special Operations Squadron
Hurlburt Field, Fla.

1st Special Operations Squadron
Kadena AB, Japan

17th Special Operations Squadron
Kadena AB, Japan

19th Special Operations Squadron
Hurlburt Field, Fla.

318th Special Operations Squadron
Cannon AFB, N.M.

USAFE

31st Fighter Wing
Aviano AB, Italy

494th Fighter Squadron
RAF Lakenheath, UK

100th Air Refueling Wing
RAF Mildenhall, UK

Missile Safety Plaques

CATEGORY I

ACC

33rd Fighter Wing
Eglin AFB, Fla.

83rd Fighter Weapons Squadron
Tyndall AFB, Fla.

AFMC

Air Armament Center Range Safety
Eglin AFB, Fla.

PACAF

18th Wing
Kadena AB, Japan

35th Wing
Misawa AB, Japan

USAFE

48th Fighter Wing
RAF Lakenheath, UK

CATEGORY II

AFMC

Air Armament Center Range Safety
Eglin AFB, Fla.

AFSPC

30th Space Wing
Vandenberg AFB, Calif.

90th Missile Wing
F.E. Warren AFB, Wyo.

Explosives Safety Plaques

CATEGORY I

ACC

4th Fighter Wing
Seymour Johnson AFB, N.C.

1st Fighter Wing
Langley AFB, Va.

23rd Wing
Moody AFB, Ga.

33rd Fighter Wing
Eglin AFB, Fla.

57th Wing
Nellis AFB, Nev.

388th Fighter Wing
Hill AFB, Utah

28th Bomb Wing
Ellsworth AFB, S.D.

332nd Air Expeditionary Wing
Joint Base Balad, Iraq

366th Fighter Wing
Mountain Home AFB, Idaho

AETC

56th Fighter Wing
Luke AFB, Ariz.

AFMC

505th Combat Sustainment
Squadron
Hill AFB, Utah

75th Air Base Wing
Hill AFB, Utah

AFSOC

27th Special Operations Wing
Cannon AFB, N.M.

1st Special Operations Wing
Hurlburt Field, Fla.

AFSPC

45th Space Wing
Patrick AFB, Fla.

90th Missile Wing
F.E. Warren AFB, Wyo.

341st Missile Wing
Malmstrom AFB, Mont.

AMC

92nd Air Refueling Wing
Fairchild AFB, Wash.

60th Air Mobility Wing
Travis AFB, Calif.

62nd Airlift Wing
McChord AFB, Wash.

305th Air Mobility Wing
McGuire AFB, N.J.

375th Airlift Wing
Scott AFB, Ill.

436th Airlift Wing
Dover AFB, Del.

43rd Airlift Wing
Pope AFB, N.C.

721st Aerial Port Squadron
Ramstein AB, Germany

PACAF

8th Fighter Wing
Kunsan AB, Korea

18th Wing
Kadena AB, Japan

35th Fighter Wing
Misawa AB, Japan

USAFE

31st Fighter Wing
Aviano AB, Italy

48th Fighter Wing
RAF Lakenheath, UK

CATEGORY II

AFMC

Aerospace Survivability
and Safety Flight
Wright-Patterson AFB, Ohio

Air Force Flight Test Center
Weapons Safety Office
Edwards AFB, Calif.

Air Armament Center
Weapons Safety Office
Eglin AFB, Fla.

AFSOC

1st Special Operations Equipment
Maintenance Squadron
Hurlburt Field, Fla.

Nuclear Surety Plaques

CATEGORY I

ACC

2nd Bomb Wing
Barksdale AFB, La.

AMC

62nd Airlift Wing
McChord AFB, Wash.

AFMC

898th Munitions Squadron
Kirtland AFB, N.M.

AFSPC

90th Missile Wing
F.E. Warren AFB, Wyo.

USAFE

31st Fighter Wing
Aviano AB, Italy

701st Munitions Support Squadron
Kleine Brogel AB, Belgium

702nd Munitions Support Squadron
Buechel AB, Germany

Space Safety Plaques

AFSPC

30th Space Wing
Vandenberg AFB, Calif.

45th Space Wing
Patrick AFB, Fla.

Ground Safety Plaques

AFMC

72nd Air Base Wing
Tinker AFB, Okla.

AFRC

315th Airlift Wing
Charleston AFB, S.C.

ACC

4th Fighter Wing
Seymour Johnson AFB, N.C.

366th Fighter Wing
Mountain Home AFB, Idaho

388th Fighter Wing
Hill AFB, Utah

332nd Air Expeditionary Wing
Joint Base Balad, Iraq

AMC

375th Airlift Wing
Scott AFB, Ill.

724th Air Mobility Squadron
Aviano AB, Italy

6th Air Mobility Wing
MacDill AFB, Fla.

731st Air Mobility Squadron
Osan AB, Korea

22nd Air Refueling Wing
McConnell AFB, Kan.

92nd Air Refueling Wing
Fairchild AFB, Wash.

62nd Airlift Wing
McChord AFB, Wash.

615th Contingency Response Wing
Travis AFB, Calif.

436th Airlift Wing
Dover AFB, Del.

USAFE

100th Air Refueling Wing
RAF Mildenhall, UK

PACAF

18th Wing
Kadena AB, Japan

AFSPC

45th Space Wing
Patrick AFB, Fla.

21st Space Operations Squadron
Sunnyvale, Calif.

Aero Club Safety Certificates

ACC

LeMay Flight Training
Center Aero Club

AFMC

Robins Aero Club

AFRC

March Aero Club

AFSPC

Rocky Mountain Flight
Training Center Aero Club

AMC

Dover Aero Club

Illustration by Dan Harman

Wingman Reader Feedback

Wingman is the Air Force's quarterly journal of occupational, operational, and off-duty safety, and the only Air Force-level safety magazine covering all safety disciplines.

Please take a few moments to fill out the following reader review of ***Wingman*** at: *http://afsafety.af.mil/SEMM/wingman.shtml.*

1. What is your military status? (If more than one applies, choose your primary status.)

- a. Active duty
- b. Guard/Reserve
- c. Civilian employee
- d. Contractor
- e. Retiree
- f. Spouse/dependent/parent
- g. Veteran
- h. Other

2. What branch of service?

- a. Air Force
- b. Navy
- c. Army
- d. Marine Corps
- e. Coast Guard

3. What is your age group?

- a. 16 and below
- b. 17-25
- c. 26-34
- d. 35-43
- e. 44-52
- f. 53 and above

4. How often do you read ***Wingman***?

- a. Each quarter
- b. Frequently (at least 3 issues per year)
- c. Rarely (1-2 issues per year)
- d. Never

5. For military members, what is your rank/grade?

- a. E-1 through E-4
- b. E-5 through E-6
- c. E-7 through E-9
- d. O-1 through O-3
- e. O-4 through O-6
- f. O-7 and above

6. For civilian employees, what is your grade?

- a. GS-1 through GS-6
- b. GS-7 through 11
- c. GS-12 through GS-15
- d. NSPS Y(x)-1
- e. NSPS Y(x)-2
- f. NSPS Y(x)-3
- g. NSPS Y(x)-4
- h. SES (all)

7. How long have you been affiliated with the military?

- a. Less than 3 years
- b. More than 3 years but less than 8 years
- c. More than 8 years but less than 14 years
- d. More than 14 years but less than 20 years
- e. More than 20 years

8. What kinds of articles would you like to see in ***Wingman***?

9. What do you like about ***Wingman***?

10. What do you think ***Wingman*** could do better?

11. Use the following space for more comments about ***Wingman***.

12. Do you prefer to read ***Wingman*** in hard copy ○ or in electronic form on the Web? ○

Return your completed feedback form to the Air Force Safety Center

E-mail: *http://afsc.sem@kirtland.af.mil*

Mail to: HQ AFSC/SEM
9700 G Ave. SE
Kirtland AFB, NM 87117-5670

Fax to: DSN 246-0931 or commercial 505-846-0931

Safety Center leadership and ***Wingman*** staff will review all reader comments. Your input will help us improve the magazine's focus on areas of reader interest. Thank you for your time and assistance.

Reporting the Class E Event

EDWARD BROWNE
Space Safety Division
Air Force Space Command
Peterson AFB, Colo.

History has taught us that there's more to space safety than just launch. The process for ensuring a successful launch and orbital insertion begins much earlier, and addressing issues throughout the entire process will make our operations safer. We need to settle into a healthy approach to recognizing, reporting, investigating and tracking our close calls. These are occurrences that don't meet reportable mishap classification criteria, but are important to investigate and report to prevent mishaps in the future. I know we are very busy, but if we fail to report and distribute lessons learned, they may lead to major mishaps down the road. As we try to report close calls, we need to ensure the processing method is as expeditious as possible; then, we need to identify a way to disseminate the mishap-prevention information. We must use whatever investigations are readily available and may be expediently input to the Air Force Safety Automated System (AFSAS).

Air Force Manual 91-222, *Space Safety Investigations and Reports*, has different classifications of mishaps, specifying some as Class E's, and then a broader, "catch-all" category called "High Accident Potential Events" that are not explicitly described. They are the events that squadron and wing space safety specialists recognize, as in, "Oh my, look at what could have happened," or, "I can't believe what just about happened." Those are the most important to report, as these are the close calls.

Ground safety specialists understand that we avoid Class A's and B's by reporting, investigating, and preventing future Class C and D mishaps. In space safety, however, there aren't many, if any, Class C's or D's. When something goes wrong, it goes very wrong, and is typically at least a Class B, but is more often a Class A.

Some of the best places to hear of those occurrences are hot washes, pathfinders, operations review boards, shift-turnover briefs, staff meetings — any meeting or discussion where people talk over "what just happened." Admittedly, these discussions are 99.9 percent void of events that need reporting, but tune in to what's being said, as catching that one instance of a close call could prevent the next Class A.

Even if that 0.1 percent of those conversations that we report doesn't prevent a Class A, we still will have collected valuable information; we'll have the trends of problem areas. Areas where we may find bad trends include technical data, crew training, maintenance training, operations procedures, testing procedures, testing equipment, software, databases, and checklist discipline.

There were trends in a few space system mishaps, such as the unfortunate one dealing with bolts — in when they were meant to be out, and out when they were meant to be in. A quick analysis at squadron and wing safety levels can help to identify the root cause — and can facilitate input into AFSAS.

The prevention value of finding those trends will come when we use them in safety reviews and final safety coordination on the next system we see hitting our inbox. We'll need to go beyond the simple topic, such as bolts; emphasizing bolts won't catch the actual trends or reveal the root cause of why the bolts were in the wrong configuration. The root cause of most mishaps is the lack of checklist discipline.

Similarly serious problems could arise in your unit from a comparable trend in any of those other areas, such as technical data, etc. that were mentioned previously. Think of each of them when looking into close-call root causes. Whatever the reason, if your unit experiences a close call, it should be documented and the root cause/ lessons learned identified in AFSAS.

Listen carefully in outbriefs and operations review boards, report the high accident potentials, get to a good root cause efficiently, and get them entered into AFSAS, so others don't repeat the same mistakes.

Operational Review Boards can be a valuable resource for documenting an incident that has many lessons learned. The ORB has documented an event and investigated it thoroughly with subject-matter experts. Ensure these incidents are recorded in AFSAS, and pass the lessons learned throughout the safety community.

The bottom line is that we owe it to the safety community and the nation to look at those incidents that could have resulted in a loss of combat capability. By accepting that we're human and make mistakes, and by being smart enough to talk about them, we'll continue to improve an already impressive safety record in the space community.

U.S. Air Force photo by Staff Sgt. Jeanette Copeland

Preventing Collisions in Space

BRIAN WEEDEN
Secure World Foundation
Montreal, Quebec, Canada

Space

Editor's note: *From 2004 to 2007, Brian Weeden was an Air Force captain, assigned to the 1st Space Control Squadron in Colorado Springs, Colo. His unit operated the Space Control Center inside Cheyenne Mountain, responsible for tracking all man-made objects in Earth orbit and producing the satellite catalog for the U.S. military. In May 2005, the SCC became part of the new Joint Space Operations Squadron, and in the summer of 2007, it moved to Vandenberg AFB, Calif.*

During his time at 1 SPCS, Weeden was certified as an orbital analyst, responsible for tasking the U.S. military's space surveillance network to track objects in Earth orbit. The unit also analyzed space events and updated the satellite catalog. Within a year, Weeden became head of orbital analyst training, working closely with the civilians performing conjunction analysis.

He's now a technical consultant in Montreal, Quebec, Canada, with the Secure World Foundation, a private space organization based in Colorado.

Author's note: *A more detailed description of this event, the consequences and corrective options, was published in Feb. 2009 in the online journal The Space Review, under the title, "Billiards in Space."*

On Feb. 10, 2009, an event happened in space that many thought was statistically impossible. Just before noon Eastern Standard Time, two satellites collided 470 miles above Siberia, at an impact velocity of more than 22,000 mph. As of the first week of March, the Air Force's Space Surveillance Network was tracking more than 500 pieces of debris bigger than a softball, and that number is expected to grow close to 1,000. The collision also created many more pieces too small to track consistently. Although we do a good job of tracking on-orbit debris, we cannot track approximately 90 percent of the on-orbit debris, due to sensor limitations. Many of these debris pieces can be lethal to active satellites.

Space debris is increasingly becoming more of a threat to our use of Earth orbit. While space is indeed vast, most of our activities are concentrated in a few critical locations, such as geostationary orbit (GEO) and sun-synchronous orbit (SSO). This means that the debris tends to be concentrated in these areas, adding significantly to the crowding. Out of about 1,200 known objects near GEO, only about 380 are active payloads under any kind of control. Of more than 4,000 objects near SSO, fewer than 200 are active satellites.

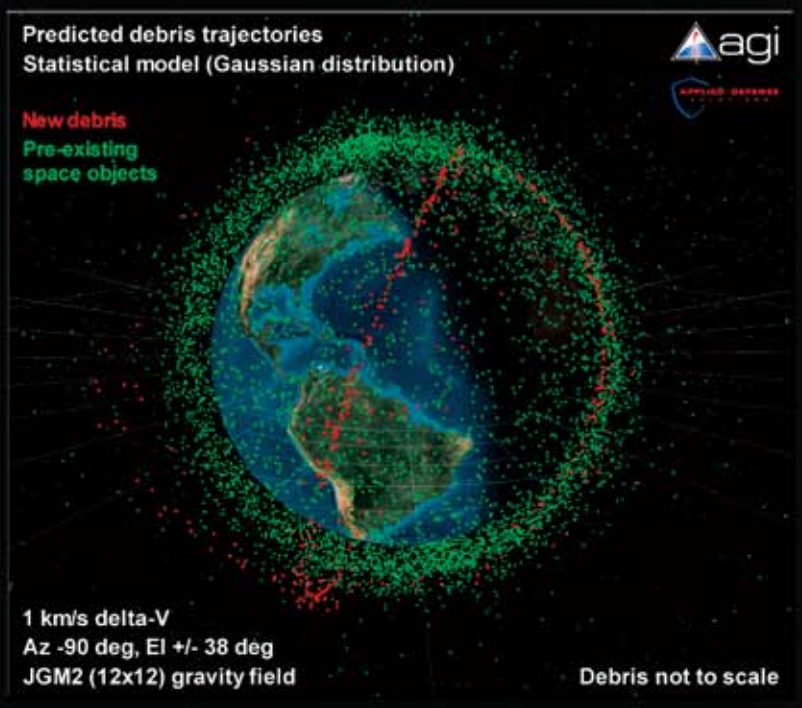
There have been collisions in space before, but never between two payloads. The previous seven known inadvertent collisions in space have all been between inactive satellites and either spent rocket stages or pieces of debris. This time, it was between an active Iridium satellite, part of the company's constellation of 66 (now 65) low-Earth orbit communication satellites, and Cosmos 2251, a defunct Russian Strela-2M communication satellite.

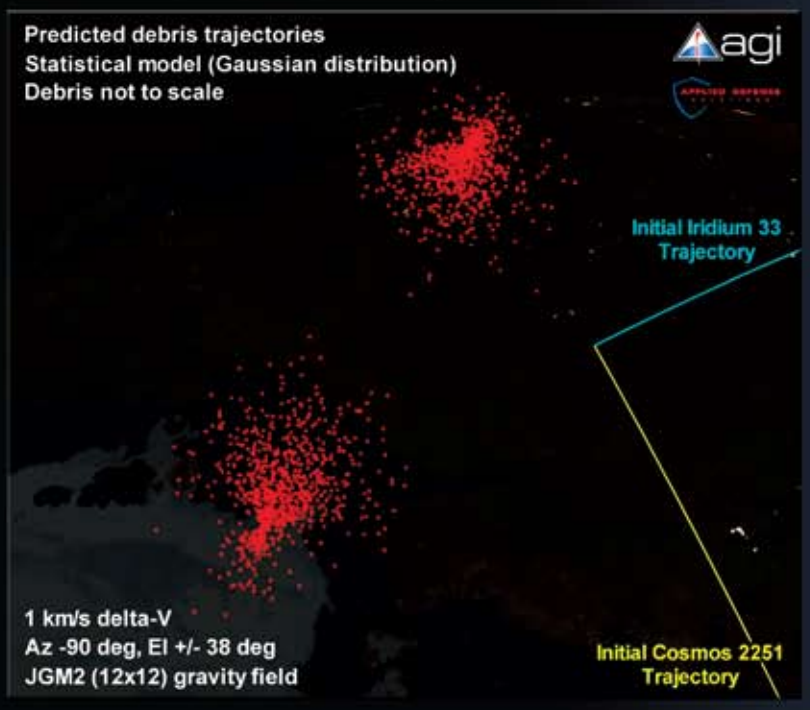
The most distressing aspect of the collision is that it appears it could have been avoided. The positions of both objects were well known to the U.S. military through the SSN and the Joint Space Operations Center (JSpOC) at Vandenberg AFB. The JSpOC also has procedures to screen satellites for possible collisions and provide advance warning to the satellite's owner-operator. However, due to resource limitations, this screening is only done for a limited list of important objects, such as the International Space Station and critical U.S. national security spacecraft. Iridium was also well aware of the risk of collision to its satellites and had been working with JSpOC to detect potential collisions until it stopped in 2008, stating that there were just too many close approaches to handle efficiently.

The good news is that there are a variety of options that could help prevent similar scenarios in the future. One option would be for the JSpOC to release its high-precision tracking data to all satellite owner-operators, allowing them to perform collision warning for their own assets. The JSpOC already releases a significant amount of data through the Commercial and Foreign Entities program, but the data is too inaccurate for reliable collision warning.

A second option is to continue to keep the high-accuracy data private and for the U.S. government to perform collision warning for all owner-operators. That's possible, but it would require a significant increase in the resources currently allocated to these processes, primarily in the number of trained analysts. It would

Image courtesy of NASA





Images courtesy of Analytical Graphics, Inc.

also require a policy debate about whether the military is the right department to be performing the task, as well as what the inherent liability and legal issues are.

The third option is for the U.S. government to allow, and preferably support, the creation of an international civil space situational awareness system. This system would have the goal of providing the basic tools necessary to enable conjunction assessment and collision avoidance by all space actors. Tools include positional data on objects in orbit, space weather data, atmospheric density, and the analytical tools to make decisions based on this data. It would also involve contributions of data on precise positions and possible future maneuvers by commercial owner-operators.

Any of these three options would go a long way toward reducing future collisions; however, they can't prevent collisions between objects that aren't under control. Of the 18,000 objects tracked by the SSN, fewer than 1,000 are active satellites, and fewer than half of those are thought to have any maneuvering capability. That's why collision warning and avoidance needs to be combined with continued emphasis on debris mitigation and research into eventually being able to remove debris from orbit. All three efforts are critical to ensuring the long-term sustainability of space for all uses, military and civilian.

Photo courtesy of author

Back to Basics with System Safety

BOB BAKER
Analysis & Integration Division
Air Force Safety Center
Kirtland AFB, N.M.

Editor's note: *The author is the Air Force Safety Center's Analysis Branch Chief and System Safety Chief. While on active duty, the retired Air Force major worked in space operations, flying communications satellites; materials research; C-130 structural engineering; mishap investigation; aircraft battle-damage repair engineering; forensic engineering; supply; transportation; aircraft maintenance (flight line and back shop); and system safety engineering.*

Today's frenetic pace of life is fueled by instant communications that relay voice and visual information at light speed. The consequence is that decisions and actions are being driven to occur faster and faster. People are being bombarded with information from all quarters, leading them to become oversaturated with information that's often competing and conflicting with other nuggets of information. In such an environment, it's easy for people to make mistakes and err in their judgment. Time and again we see the outcome of rushed decisions and hurried actions … the F-18 over San Diego; the Shuttle Challenger; the Mars Climate Orbiter; loading nuclear weapons … the list goes on. Inherently complex operations performed in an environment where the system operator is inundated with information sets the stage for failure.

To combat such failure and refocus the Air Force, the Chief of Staff is emphasizing a strong "back-to-basics" approach to air, space, and ground operations. Concentrating on the basics allows us to regain lost proficiencies and to identify and mitigate the hazards in our operations.

System safety is one of those basic elements that allows us to conduct operations in a smarter, safer manner. As a science, system safety was born out of the early space and missile programs of the 1950s, with roots back to 1946.

The underlying premise of system safety is to examine a system in-depth to identify hazardous conditions arising from energy sources, unintended or inadvertent operation, and human failure. System safety professionals look at the way the system can fail, and then propose solutions to mitigate the failure. Once identified, the hazardous condition is elevated to the risk-decision authority … the person who has the resources to mitigate the risk associated with the hazard or who may accept that risk on behalf of the Air Force.

The system safety discipline grew, and procedures matured during the '60s, '70s and '80s. With increas-

ingly complex weapon systems entering the inventory and the burgeoning use of computer automation, the science was expanded to include software system safety. This branch of the discipline examines those critical functions and controls performed by computers. System safety professionals look at the software and the functions it performs and controls. They identify the ways the software will behave in the presence of spurious signals and examine hardware actions or configuration changes driven by those signals. These hazards are tracked, along with the physical system hazards, and elevated to the risk-decision authority for mitigation or acceptance.

During the '90s, system safety hit a plateau when Mil-Standard 882C, *System Safety Program Requirements*, was rewritten to accommodate acquisition reform. Simultaneously, fewer new systems were being acquired than in previous decades.

The new millennium has seen a resurgence of major acquisition programs. With new systems in development, it's important to return to the basics that have proven themselves over time.

System safety works to reduce mishaps, prevents extended downtime needed to correct design deficiencies, and identifies system weaknesses early in the development phase, when it's more cost-effective to implement fixes.

The new millennium has also seen the application of system safety processes and methodologies to medical procedures and surgical suite design. During this time came the ascendancy of human systems integration, focused on the human interaction with the system. It addresses physical and cognitive interfaces with the mechanical device. Through an in-depth understanding of the system, how people operate it, and how they process the system's aural and visual information, designers and engineers can greatly reduce the likelihood of human-error mishaps. System safety, operating in conjunction with HSI, has the potential to greatly reduce mishaps from both the mechanical and human elements of the system.

System safety and HSI are good tools used on the front end of design for aircraft, space systems, weapons, and facilities. Properly applied, these tools allow us to look forward to what might happen and take action to prevent those events from occurring. They don't, however, capture information about the organizational and managerial hazards associated with system operations.

The Safety Center has developed a tool called the Safety Analysis Team to look retrospectively at the collective mishap experience of a MAJCOM or NAF/Center. This process looks at mishaps that have occurred over a given period for a given command. The SAT identifies hazards within each mishap and scores them for their overall contribution to the mishap sequence of events. The hazards are then analyzed in aggregate across the entire dataset. The team's analysis shows the most prevalent hazards identified and presents potential solution strategies to buy down the risk from the associated hazards.

This methodology has been successfully applied to flight operations at the DoD level, AFSOC and AMC; ground-industrial operations at an air logistics center, test center, and at PACAF; and is slated to examine vehicle mishaps for DoD. The process is tailorable and can be used to analyze operations from wing to MAJCOM, and is suited to most operations, including space operations and weapons operations.

One of the next challenges is to apply the SAT methodology to a specific weapon system family, to identify hazards with a specific system.

Application of system safety, human systems integration, and the Safety Analysis Team processes represent the most fundamental return to the basics and can be used to guide commanders in identifying hazards system-wide.

U.S. Air Force photo by Tech. Sgt. Paul Flipse

Space

Preventing Mishaps from Outer Space

Editor's Note: Lucky Lottie
This fragment of a Delta II fuel tank caused no harm. Odds are growing that people will be hurt by re-entering space debris (see inset photo).

MAJ. DAN RYAN
Chief of Space Safety
Air Force Space and Missile Systems Center
Los Angeles AFB, Calif.

"Ow! What the … ?!?"

I imagine that's what Lottie Williams uttered Jan. 22, 1997, while walking in a park in Tulsa, Okla., as a piece of Delta rocket debris bounced off her shoulder. Ms. Williams is widely regarded as the only person known to be hit by space debris. Odds are increasing that her club will become less exclusive.

Used rocket motors, dead satellites, material discarded by astronauts … it's no surprise the stuff comes back to Earth. What you may find surprising is the amount of research and regulation that goes into controlling what we call "expectation of casualty"— the chance space debris will kill or seriously injure someone. Governmental and international bodies hold regular working groups to address "orbital debris mitigation" and "re-entry risk management." Fluid dynamicists and materials scientists determine which spacecraft designs and materials best decompose during atmospheric re-entry. Space-debris generation is even reviewed in the environmental impact assessment for a spacecraft launch.

You may think, "Surely, all that red tape and those people wearing pocket protectors are making things safer." Actually, yes and no. Yes, the efforts to limit the size and quantity of re-entering space debris are helpful. No, the chances of someone getting hurt are not decreasing.

Here's why. By international convention and U.S. government policy, we aim for less than one chance in 10,000 that someone, somewhere on the face of the earth will die from the re-entry of a spacecraft. That's a surprisingly tough number to achieve, even for small "tactical" satellites. For satellites and rocket motors that will simply not break up into small enough pieces, we have the option of controlling their re-entry into the ocean, leaving them in safe orbits, or shooting them down — options that add a lot of cost and complexity to the mission. As more countries launch more satellites with more rockets, the "one-in-10,000" odds go up. As the Earth's population grows, particularly in latitude swaths where re-entries are more likely, the chance that a person will occupy the spot of ground where the debris is headed climbs higher.

I imagine this is strange stuff to many, even those in the Air Force safety community, but the methods we use to prevent and report space-debris mishaps and close calls will be familiar. For example, we submit high-accident-potential reports (Class E mishaps for space) using the Air Force Safety Automated System. The AFIs for mishap prevention and reporting have space chapters. Organizationally, space safety offices now exist alongside aviation, ground, and weapons counterparts at the Air Force Safety Center and MAJCOMs, and at wings that have or support space missions.

Now if you'll excuse me, I see something bright streaking across the sky.

Author's note: Visit the government-funded Aerospace Corporation's Center for Orbital and Re-entry Debris Studies Web site for information on space debris: ***www.aero.org/capabilities/cords/.***

Photo courtesy of NASA
Inset photo courtesy of Tulsa World

Blue 2

COL. SID "SCROLL" MAYEUX
Chief, Aviation Safety Division
Air Force Safety Center
Kirtland AFB, N.M.

Nothing wakes you up faster than getting shot at. I know. When you go to combat in a Wild Weasel, getting shot at just happens. So we train, train a lot, and get really good at what we do, as does our deployed Air Force. Now that we've been fighting an air war on two fronts for more than half a decade, plus nearly two decades of continuous deployment, Air Force Airmen have broken the code on deployed ops.

Happy summer, gang. Today's mission objective for this ***Wingman's*** aviation safety section is "Deployed Operations Safety." I'm Blue 2 with the tactics brief.

We have two types of Airmen these days: Those who have deployed, and those who will. By now, those who have should have already been giving those who will the 3-D rotating prismatic situational awareness on what it's like to fly in combat in today's OIF/OEF skies: long, hot days, the "Groundhog Day" factor, and the same old same old, sprinkled with occasional extreme overload. It's way easy to get complacent … right up to the moment you're actually called in to employ ordnance, medevac a soldier from a forward operating base at night, beam overhead insurgent video to a ground commander, airdrop ammo to troops in contact, do night special operations forces inserts on nogs, toboggan that emer-fuel fighter … you get the picture. You've trained hard for this. Now you're flying, fighting, and winning … the tip of the spear.

Are you really fighting like you trained? Or at some time during the mission, did you say, "I'm doing it differently because we're in combat … I don't have time to do things by the book"? If you did, I'd say, "Danger, Will Robinson." You just became a deployed ops hazard — yes, *hazard* — to yourself, your jet, your crew, your maintainers, wingmen, and local recipients of your otherwise dedicated service.

Fight like you train. That age-old axiom applies to everything we do in combat: systems and SPINs/ROE knowledge, preflight planning, tactics development, preflight briefing, aircraft and weapons inspection, ground ops, meat of the mission, threat reactions, IFR or VFR recovery, and debrief. If we take one shortcut anywhere … just ONE … we endanger ourselves, our wingmen, civilians, and friendly forces. *Fight like you train*.

Deployed unit safety programs must not be any different. It's far too easy for deployed unit safety offices to say, "We don't have time to take all the investigation steps required by the reg. We're fighting a war! Let someone else look into these engines. We don't want to do it, because we have more important things to do."

Whoa! Did a safety officer just say, "Safety's too hard … "? Engines, aircraft, and Airmen aren't expendable. Bombs, beans, and bullets are.

"Preserve combat capability by preventing mishaps." That's safety's mission, from the Pentagon, down through the deployed safety offices, to the Airman calling the "knock-it-off."

This edition of ***Wingman*** features Airmen who fell into their own custom-made deployed ops pitfalls. I'm handing them the chalk to debrief us on their lessons learned. ***Blue 2's engaged!***

HQ AFSC photo by Dennis Spotts
Photo illustration by Dan Harman

Maintenance Spoken Here: Deployments

CHIEF MASTER SGT. SANDY STACY
Aviation Safety Division
Aircraft Maintenance Safety Manager
Air Force Safety Center
Kirtland AFB, N.M.

"OK everyone, get ready to gear up for the next deployment." How many of you hear these words and are filled with dread? With excitement? The dread is leaving your friends and family for several months, and the excitement is probably because you want to get out there and fix aircraft without all the extra "stuff" you have to do at home.

If you're the chief, deployments are excellent opportunities to walk the ramp, talk to your people, and maybe get your hands dirty by turning some wrenches alongside the younger guys. It's also a terrific time to get into the T.O.s and see what's changed since you were a one- or two-striper. You'll be amazed how much fun you'll have and how much your people will enjoy it, too. If you want to throw in some more entertainment, take your OIC with you and amaze him with your knowledge of the aircraft or test station!

If you're a section chief, deployments are perfect for getting back to the basics of maintenance. While you're trying to stay two steps ahead of the chief, take a look at how your people are doing their jobs. Do they have the proper T.O.s at the job site, and are they using them for something other than pads to kneel on? Are they using the proper PPE? Take a look at their goggles and see if you could work with them on ... are they clean and scratch-free? Check out the PMEL stickers on their torque wrenches and pressure gauges. Are they current? How about their CTKs? Do they have the proper tools to do the job, or are they improvising?

When your focus is on just doing maintenance, you can accomplish a lot. Ask your people what they need in order to do the mission; they have the answers. If they need tools, order them. If they need more maintenance stands, talk to your AGE counterparts. You get the idea. If you do those things, then your people will be able to do their jobs better, safer, and probably a great deal quicker.

Speaking of quicker, how many of you think being deployed gives you the right to "speed" when doing maintenance tasks? I'll bet many of you are saying, "Yes it does." I'm here to remind you that it doesn't. Being deployed is actually a time when doing things by the book is even more important. You cannot afford to lose a single sortie because of poor maintenance. T.O.s are written for you to accomplish the job in the most expedient manner without endangering people or equipment. Why, then, do you want to deviate from what's written, in order to do the job faster? If you have a better way

to do the task, then submit a T.O. change. Until it's approved, follow what's currently written. We lose aircraft every year because someone fails to follow the T.O. for some reason. Don't be that person. You want to be the one who says "knock it off — we need to do it right."

Just because you're deployed doesn't mean safety rules don't apply. When you get to your deployed operating location, look around. Walk through the aircraft shelters, parking ramp, and any area where you'll be working. Are there enough fire bottles? If not, find some. Are there eye-wash stations, and have they been inspected as required? If not, talk to your supervisor to get them replaced or inspected. Where are the emergency circuit breakers, in case you need to shut down a test station? Locate them and make sure everyone knows where they are and how they work. Drive to end-of-runway and check out where you're going to park your vehicle so it's out of the way of taxiing aircraft. Inspect the LOX-servicing area. Is it on an approved surface? If not, find someplace else to do the servicing until you can get it fixed. Inspect where you're going to park the aircraft. Are there grounding points close enough to reach with your ground cords? If not, find another way to park, or build longer ground cords. Walk the taxiway looking for potential FOD problems and work with CE to fix them. In short, don't accept inadequate or unsafe work areas just because you're deployed.

Once you've identified obstacles to doing maintenance at work, what should you do? How about looking at your work/rest cycle? During deployments, you work long hours and more days in a row without a day off than you do at home. Is this a good thing? In some ways, yes. After all, you're away from your family and other "distractions," so working is a great way to pass the time.

However, only working can be stressful and will wear on you if you don't find a way to relax. Many people begin a workout program, take off-duty classes, or spend time playing games. Whatever you do, make time to relax your mind and body. If you're a supervisor, ask your people what they do when they're not working. If they're just sleeping on their day off, encourage them to get involved in things going on around the base. Keep an eye on each other, and if you see people starting to get stressed out, talk to them. They may need an extra day off to recharge their batteries, or a day where they only perform the simplest tasks. Not everyone has the same capacity for working nonstop. Treat people as individuals and help them perform to the best of their abilities while they're deployed.

When you're deployed, you're doing what we all train to do — fix aircraft so they can fly the mission. Whether you're a tanker, fighter, cargo, or UAS maintainer, what you do is important, and doing the job safely and by the book is the only way to go.

U.S. Air Force photos

Only as Good as the Weakest Link

MAJ. JOEL STEPHENS
463rd Airlift Group Flight Safety Officer
Little Rock AFB, Ark.

As I reflect on my flying experiences in Afghanistan and Iraq, I am humbled at where I am now as an aviator, compared with where I thought I was. I'd heard and almost scoffed at the saying, "There are old pilots and there are bold pilots, but there aren't a lot of old, bold pilots." After all, I'd spent countless hours studying and training to become a pilot, and my hard work had finally gotten me to what I considered the epitome of aviation: a C-130 aircraft commander leading a crew in a combat environment.

Before I continue with my story, here's a little background information to set the stage. I'd had four flying deployments to the Middle East under my belt as a co-pilot and had taken the good with the bad. I'd taken lessons learned from my previous crews and tucked them into what I thought was a pretty nice bag of tools and tricks. I was a bit older than the average new aircraft commander, and due to the current ops tempo, had deployed more than most, including everyone on my crew of six combined.

The Air Force trains aircrew on and emphasizes crew resource management, which simply means managing and using all the people, information, and equipment available to a crew. Using that philosophy, the Air Force encourages "hard" crews in the combat environment. That way you always fly with the same people, allowing you to learn each others' habit patterns, develop a flow to maximize crew efficiency, and ultimately capitalize on CRM principles. That leads me to say, "There I was … ."

I'd been flying with my crew for more than two months, but on that day, I had a co-pilot who wasn't new to flying, but was new to flying with me. I considered myself capable and knowledgeable in "desert" flying. My crew trusted me, and we flew in and out of countless fields using the same techniques. After more than 250 hours of flying together, we'd become a well-oiled machine. I was probably a more aggressive pilot than most. I now realize I sometimes confused being "tactically sound" with being "overly aggressive."

After a long night of flying in Afghanistan, including an unplanned divert due to an indefinite airfield closure when a plane ran off the runway right in front of us, the sun was rising as we were on our last leg, ready to get some sleep. The crew departure briefing was my "standard" briefing. What I didn't account for was my new co-pilot.

I flew what I considered to be "tactical." I'd fly as fast and low as the "Herc" and our directives would allow, choose a random and remote site, and then "zoom-climb" the aircraft through an altitude that I believed would clear us from the most probable threat we faced. That's how I'd been flying it and intended to fly it that morning.

My navigator and engineer both were familiar with the flight parameters I was shooting for, but the co-pilot wasn't. Additionally, his previous flights with a different crew didn't use the "zoom-climb," so his exposure and ultimately proficiency was minimal. I live by the philosophy that what is understood need

U.S. Air Force photo by Airman 1st Class Jason Epley

not be said. With that mindset, you can probably infer that my crew briefings were short, covering only what I thought was necessary.

On the departure that morning, everything was standard; I maneuvered the aircraft to set up for the "zoom climb." After checking with my loadmasters to make sure everything and everyone was secure in the cargo compartment, I said, "Here we go." With the Herc flying at a swift 250 knots, I began a steady pull to start a climb with 25 degrees nose-high, pointed into the sun.

At 180 knots, I began a 30-degree bank turn on course. When I tried to roll out of the turn, the aircraft continued to roll, approaching 60 degrees. Feeling the aircraft was unresponsive, I began a full turn the other way, attempting to stop the roll. Simultaneously, the airspeed was approaching 150 knots, still well above stall speed, but slower than I intended to get.

At that moment, I thought I had an asymmetrical engine problem causing the aircraft to continue the roll, so I reacted by neutralizing the flight controls and going to flight idle on all four motors. Realizing I needed to gain some airspeed, I pushed the nose over, creating a slight negative-G condition. That caused my engineer and navigator to float and get momentarily pinned to the ceiling. The co-pilot was slightly disoriented, so no one on the flight deck was backing me up or was aware of what was happening.

As the aircraft began the dive, airspeed increased, and I was able to gain control over the rolling movement. However, we were in rapidly rising mountainous terrain, so I had to execute an aggressive dive recovery, as the ground was quickly approaching. After the recovery, a bit of confusion and chaos ensued and was sorted out, the details of which aren't relevant to the point of this story.

What is relevant is what really happened. How I thought I was flying and how I actually was flying was a bit off. Turns out that instead of 25 degrees nose-high, I'd really pulled to 40 degrees nose-high, causing a much more rapid climb and reduction in airspeed. I performed the maneuver mainly looking outside the aircraft, scanning for threats, with a frequent cross-check inside at my instruments. However, I was temporarily blinded by the sun, so when I looked back at the instruments, I couldn't see them. Remember that I hadn't thoroughly briefed the co-pilot on what parameters I was looking for, and you can see why at that moment I was an "F-130."

You may be asking, "What's the point of the story"? The C-130 is a crew airplane for a reason. A crew is only as good as the weakest link, and when a crew member doesn't have all the information he needs to perform his duties, he becomes the limiting factor. It's the aircraft commander's job to ensure everyone is working together and on the same page. On that day, I failed to do my job. Although nothing more serious than a memorable crew-bonding moment happened, the potential was there for something much more serious to occur.

CRM is vitally important. The Air Force gives us all initial training that emphasizes its importance. Additionally, we receive annual refresher training in the simulator. We've all seen or heard of mishaps where human factors was the only cause. CRM is our best "preventive" tool to ensure human factors mishaps are kept to a minimum. We must all not just hear the importance of CRM, but incorporate it into all our flying endeavors.

When Giants Fall

Aviation

MAJ. STEVEN A. PEEPLES
Deputy Chief, USAF C-12 Ops/Training
Air Force Materiel Command
Fort Rucker, Ala.

As with most safety incidents, this story doesn't just start with an unexpected turn of events and a human's reaction. This story starts for me in the mid-1990s, in pilot training. As a student in one of the first classes of Specialized Undergraduate Pilot Training, things were different. The Air Force was different, too, as there were deferred pilot training slots, requiring those affected to wait up to three years to get a chance at training. There was also a pilot "bank" for those who'd graduated but couldn't immediately get into an airplane. It was a turbulent time for pilot-training students and instructors alike, as they all worried about their futures as pilots.

As I made my way through pilot training, I ended up selecting the tanker/transport track and flew the T-1A Jayhawk. As a brand-new aircraft, it was nice to fly, but it was really the quality of the instructors that set the program apart. One of my main instructors was a former Northrop T-38 Talon First Assignment Instructor Pilot who'd decided to switch to the T-1 as initial cadre. I liked his instruction style and techniques, and started to formulate how I wanted to act as a pilot based on what I saw him do.

The initial respect I gave my T-1 instructor influenced the way I taught as I became an instructor over my next two assignments, where eventually I ended up flying the C-5 Galaxy at Dover AFB, Del.

As an instructor pilot, I was assigned a vice presidential support mission to Miami, Fla. My co-pilot for the trip was to be my former T-1 instructor. He'd recently arrived from another training job at Air Education and Training Command and had not yet upgraded to aircraft commander in the C-5. I thought it was great to fly with him again, but I must admit I was initially a little intimidated by having the roles reversed, where I was assigned as his instructor.

The mission was seemingly very simple. He'd get the positioning and depositioning legs between Dover AFB and Andrews AFB, Md., and I'd fly the active legs between Andrews AFB and Miami. The vice president was giving a speech in Florida, and we were needed to take the limousine, communication vans, and support staff. The legs to Andrews AFB and Miami went smoothly, and we were rewarded with two warm winter days in Florida before we carried the cargo back to Andrews AFB.

On the return trip, the weather was a significant factor. With a reported 200-foot ceiling and one-half-mile

U.S. Air Force photo by Senior Airman Jeffrey Allen

visibility, I initially flew the ILS Runway 1 Left, but by the time we arrived at the decision height, the weather had dropped below minimums. My co-pilot expertly called the "go around," and we executed the appropriate procedures. I felt a little embarrassed that I wasn't able to make the first landing attempt in front of my former instructor, but took comfort that it was due to deteriorating weather. We rechecked the weather for both Andrews AFB and our alternate airport and verified we had enough fuel for at least one more attempt to land at Andrews. I returned to the radar pattern for the ILS Runway 1 Left Category II. That required a lot of crew coordination, and as it was our third leg flying together, everything went just as the Dash-1 directed.

After our normal four-hour ground time for downloading cargo and refueling, it was my co-pilot's turn at the controls, flying from the co-pilot seat. I'd asked if he wanted the pilot's seat for his leg to get more taxi practice, but he decided to stay where he was. We had a normal departure and knew we'd be busy on the short flight to Dover. Though requiring an alternate, the weather at Dover wasn't a significant factor. My co-pilot decided to fly the ILS Runway 1 approach. During the approach, I said to him that he was flying high on the glide slope and slightly fast. Speed management is a factor with the C-5, because an object that big in motion has a lot of inertia and doesn't really want to slow down. He made only slight corrections, but we were within all our approach tolerances.

Technical Order 1C-5A-1 states that for landing you're to "cross the threshold at approach speed at an altitude of 50 feet/published threshold crossing height for approaches." This altitude is called off the radar altimeter, and the standardization/evaluation criteria requires crossing the threshold at an altitude of no less than the published threshold crossing height, or 50 feet up to 100 feet, within 5 knots below or 15 knots above the approach speed. We broke out of the weather at about 500 feet above the ground, and he continued to fly the ILS information, although still high and fast. I again said that we were high and fast, but received no verbal reply.

As we crossed the runway threshold, we were at approach speed plus 10 knots and at 110 feet. He pulled all four throttles to idle. I called "go around," since we were outside the crossing height tolerances. There was no response. I immediately looked directly at my co-pilot and again called "go around," as our sink rate increased from pulling the throttles to idle. I couldn't imagine that he didn't hear me or he didn't see what was setting up to be an unsafe landing. He seemed fixated on landing. The insecurity I'd had at first about his being my instructor also kicked in. I had a few milliseconds of doubt that he might have more experience and know better what he was doing. Again there was no response to my command, or adjustment to what was happening with the sink rate. I said, "My airplane, crew. Go around," as the airplane started to settle into a high sink rate. I immediately pushed the throttles to the maximum in-flight setting, and it was an agonizing wait for the old turbofans to spool up. The engines started to respond a few seconds before the main gear firmly touched down. I maintained aircraft control in what turned out to be more of a touch-and-go landing.

After climbing out and coordinating with the tower and approach control for another ILS, I started to question my co-pilot. He'd heard and responded to my taking the airplane and to the cleanup items, and the rest of the crew had heard my "go-around" calls, so it didn't seem like an intercom malfunction. I kept my discomfort to a minimum, and asked my co-pilot if he was ready and wanted to try another approach. I debriefed what I'd seen and why I called the "go-around," then he took the controls back and flawlessly executed the second approach and landing.

During the crew debrief, I kept to the facts that a "go around" had been called and that there was no response. The loadmaster said he was particularly concerned not hearing the engines spool up, and his confusion about what else could be happening to cause multiple "go-around" calls. We discussed as a crew the challenge/response methodology and the reason I took the controls. The other item discussed was why I'd allowed the co-pilot to make the second approach and landing, versus just retaining the aircraft myself. I reasoned that I didn't think the co-pilot was inept or malicious, and since I was an instructor, it was my responsibility to ensure the proper training was given.

The crew seemed satisfied and I learned a very valuable lesson. I'd been a victim of the "Halo Effect," in which an individual is esteemed to be good at many things because of a belief that he's good at one thing. My prior relationship with my instructor allowed me to inflate his status, and instead of reacting to the observed poor performance, I hesitated and let things go longer than I was comfortable with. Luckily, there was no damage done. Had this been another co-pilot, I would have reacted much quicker.

I've learned that for safety concerns, there's only one standard. No matter who you're sitting next to, you must always be vigilant in performing your flight duties.

In-Flight Refueling ... of You

LT. COL. PAUL "BUGSY" GARDETTO
Human Factors Division
Air Force Safety Center
Kirtland AFB, N.M.

Mission planning ensures we consider contingencies, diverts, and all the things we need to think about before flight. That's how we make sure the jet, route, and tactics are sound.

That's great for the machine, but what about the man? How do we mission-plan ourselves to ensure our best performance? If you're like most, you hit the bathroom, slam a Red Bull, and do a quick valsalva to make sure you're good to go. You hope to function at 100 percent throughout the day, but in reality, you probably start at 110 percent and drift to 65 percent at the end of the flight, assuming you didn't stay awake all night thinking about your flight. If your personal in-flight refueling plan is to eat when you're hungry, drink caffeine when you're tired, and nap when you can't stay awake, you're performing marginally, at best. Your "good- to-go" threshold should include the ability to handle an EP.

Let's use an operational scenario to discuss the challenges. Your flight is fragged as a cross-country from Kadena AB, Okinawa, to Hickam AFB, Hawaii. SPINS require a landing no earlier than 7 a.m. local. For the nine-hour flight to the east, plan to depart Okinawa at 5 p.m. local.

Your job is to mission-plan the following: 1) doing the job, 2) aircraft refueling, 3) aerial refueling of you (eating), and 4) contingencies and EPs.

This article addresses item No. 3, "aerial refueling of you." To optimize your performance, you need to optimize the environment. We'll mission-plan these variables: 1) sun, 2) circadian low point (nadir), 3) caffeine, and 4) food (carbohydrates vs. proteins).

Step one is to develop a graphic to depict the time challenge. Draw a timeline with departure-base local time on the top and destination-base local time on the bottom, with light/dark cycles depicted (see Figure 1). The first thing you note is that you'll face six hours of darkness, a lot less than normal. Also note that you'll land at 7 a.m. local, with sunrise an hour before. The sun will increase your alertness, but you'll also face what I call the physiological "kick in the face." Anyone who's flown into a rising sun knows how painful that is. Plan to land either while it's still dark, or at least an hour after sunrise, to allow you to compensate. The next thing you should look at is when the low point of circadian rhythm (called the "nadir") will occur during this flight. The nadir in performance is between 3 a.m. and 5 a.m., when you're at your lowest level of alertness and performance. Personal circadian

U.S. Air Force photo by Lt. Col. Tyoshi Tung

Mission Planning
Figure 1.

rhythms don't care what time it is when you arrive in a new location. Eventually, your natural circadian rhythms will adapt to your new location.

In this scenario, your personal nadir in performance will occur about two hours after landing, because your body clock will still be on Okinawa time. However, you're nearing the nadir on your performance curve at the end of the sortie and should plan accordingly. It's worth noting that your supporting organizations, such as air traffic control at Hickam, are outside their nadir. However, when you land, will the tower folks be at the end of their work day or the beginning? It's worth asking and planning for.

Given nothing else, your performance looks like the depiction above, dropping off throughout the flight as you get tired and bored. If just staying awake were enough, we could end this discussion here, but you have a job to do. It could be refueling, tanker ops, hostile declarations, collecting intelligence, dropping blivets … whatever you're there for. In this fairly benign scenario, we've interspersed aerial refueling every two hours. Some will be in the weather and some VMC, but all will require your full attention.

Figure 1. Mission-planning chart. Yellow line depicts normal/notional physical and mental performance. Black is caffeine-enhanced performance.

Step two of this mission-planning exercise is to plot your mission events on this timeline. The goal now is to use all the tools in your arsenal to maximize performance during these mission events, while taking a mental break between events, without losing your ability to handle the inevitable EP.

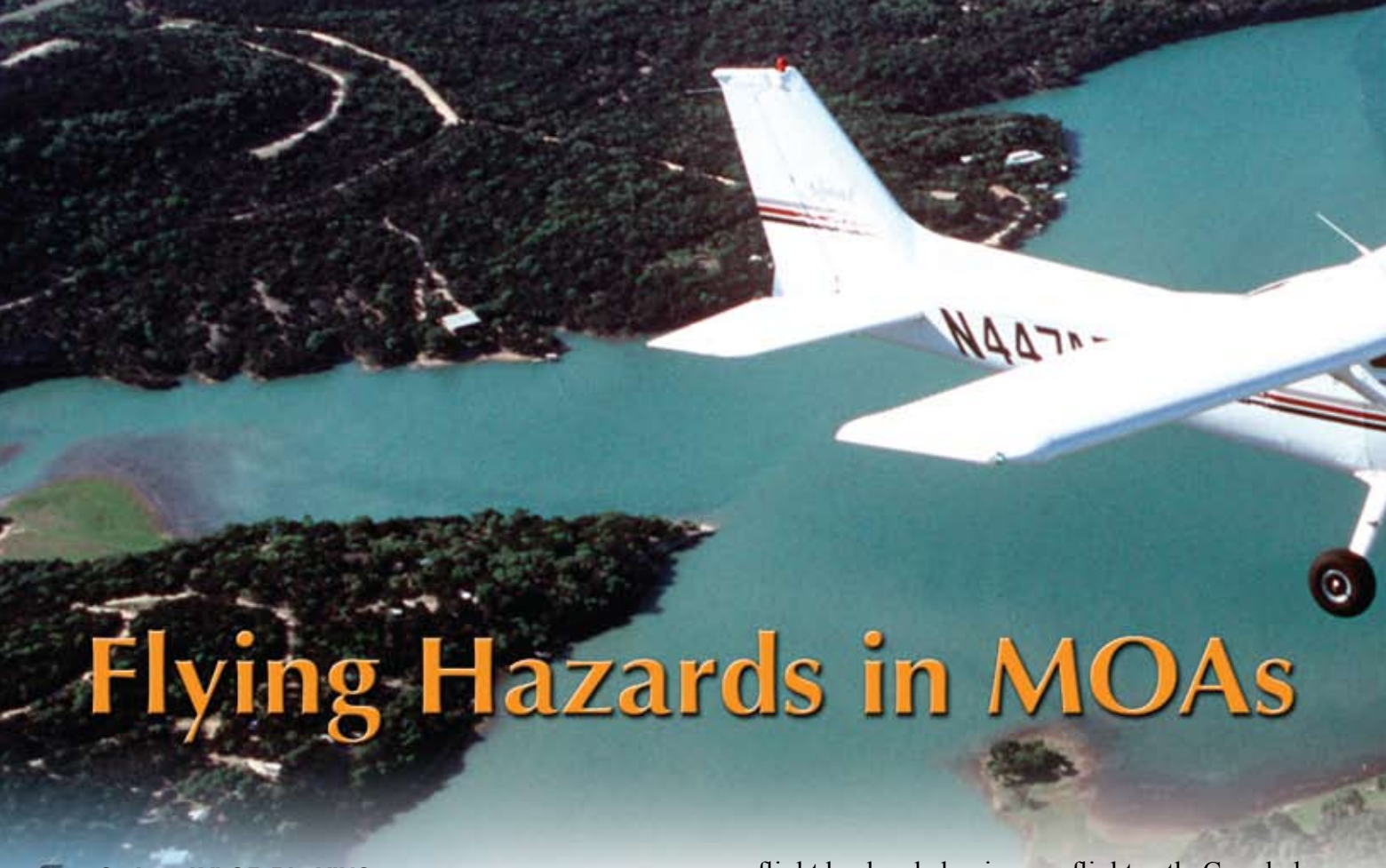
Step three is about the in-flight refueling of you. Remember the six-pack of Red Bull, two Diet Cokes, and liter of Diet Dew you brought along? If you slammed half of them during the first two hours, thinking you'd ride the caffeine wave through to Hawaii, you're foolish, because a few hours into the nine-hour flight, you're dragging all the way to the tanker.

How about some "strategic caffeine consumption"? That means using caffeine before events requiring maximum alertness and avoiding caffeine in between events. Caffeine works. The Air Force is studying timed-release caffeine pills. U-2 pilots already get caffeinated pudding in a tube. You've got your stash of Red Bull and, for this scenario, you'll use limited amounts 20 minutes before your mission event. We aren't trying to max-perform the entire flight, so save it. Instead of your performance drifting off throughout the flight, we've purposely entered peaks and valleys, raising alertness at times and allowing rest at others.

Watch out for sugared sodas, as they add a whole 'nother factor in the equation. Sugar! Gotta love it. Glucose is brain food, one of the few macromolecules that can pass through the blood/brain barrier. Remember that kid in grade school who ate sugar packs? He was a genius … for about 30 minutes, and then he was dragging the rest of the day. An hour and a half after that sugar buzz, hypoglycemia causes you to get hungry again and makes you tired.

Your mom was right when she told you to eat a hearty breakfast, including eggs. She may not have understood that meals high in protein and complex carbohydrates stabilize blood glucose levels throughout the day, but she was right. Before your flight, eat a meal your mom would be proud of, and bring along protein bars to eat during the flight. A high-protein meal may also minimize in-flight digestive waste products … bonus.

Your goal should be to sustain 90 percent performance throughout the flight, with well-timed peaks. If you strive for 110 percent, you'll oscillate between 120 percent and 70 percent, without regard to mission events. If you spend half as much time mission-planning your personal in-flight refueling as you do refueling the jet, you'll find your world will be a much better place.



Flying Hazards in MOAs

1ST LT. TAYLOR BLEVINS
77th Fighter Squadron
Shaw AFB, S.C.

Aviation

As much as I'd like to dazzle you with a "there-I-was" story, I've chosen to take a different route and highlight a growing trend in military aviation that could ultimately lead to a story without a happy ending. Many factors contribute, but they all point to the same conclusion — our military operating areas are becoming much more hazardous for operating the world's finest aircraft, and it's only a matter of time until we swap paint with our flying brethren of civil aviation.

The 21st century is upon us, and nowhere is that more obvious than in the cockpit of America's single-seat fighter aircraft. As technology continues to soar, so do the number of sensors and systems that a single pilot is called upon to operate. So much so that our tactics themselves are evolving to the likes of which the fighter community has never seen. The idea of mutual support through your wingman or flight lead is beginning to fall by the wayside, as we're now embracing sensor formations that allow flight members to be beyond visual range while still part of the same formation.

Why? Because we need to spend more time heads-down in the "drool bucket," managing these different sensors, and less time looking outside for our flight lead and clearing our flight path. Coupled with rising gas prices and the higher likelihood for civil aviators to save a little gas money by taking the most direct route to their destination, even if it means flying through MOAs, we're faced with a potential problem that could cost both airplanes and lives.

Although the F-15E Strike Eagle is an exception to the single-seat fighter argument, it's our only fighter deployed in a dual-crew arrangement. Furthermore, our future aircraft, such as the F-22 and F-35, are single-seat-only jets, and with these leaps in technology come even more sensors available to the operator. Before we get ahead of ourselves and extrapolate into the future, let's take, for example, the U.S. Air Force's most prolific fighter today, and see just how much information and data is available.

"Dual-carriage" is a term that the F-16 Block 50 community uses to describe a configuration in which the jet has two separate targeting pods mounted to aircraft hardpoints. Each pod is a sensor and projects data onto one of the two separate multifunctional displays. The data may be as simple as a display of threats in relation to a common bull's-eye position, or as complex and intricate as a God's-eye infrared view of the ground below the jet. Link 16 is a real-time network that allows pilots to gather information on both friendly and hostile forces in the air and on the ground. Along with the information the radar

displays and the data that miscellaneous weapons provide, it's easy to see how a pilot can spend too much time head-down and neglect one of the most fundamental tasks of flying — clearing.

Certainly, not all pilots are at fault for this, but for a young and inexperienced wingman, it takes more brain bytes to accurately process and appropriately react to the information being displayed than it does for a flight lead or instructor pilot with more than 1,000 hours in the jet. Having said that, I've never been on a sortie where the importance of looking outside and remaining visual and in the proper formation position with my flight lead wasn't extensively briefed and emphasized. We've gone away from visual formations and moved into sensor formations, relying on sensors and looking down at MFDs, instead of relying on our eyes and looking outside to remain in the proper position. It's apparent how this trend could potentially lead us to a troublesome outcome. The "big-sky theory" works most of the time, but we can't be willing to base the safety of our people and assets solely on dumb luck and favorable odds.

Those are the reasons we need to go back to the basics with clearing and looking outside, and we must also educate and inform civil aviators of the risk they face by flying through MOAs. We all know that military airspace is by no means an untouchable area for those who take to the skies not wearing a baggy green flightsuit. It's important to educate those who may be unaware of the training that occurs in this airspace and of the hazards they face and impose when they enter unannounced and unknown.

Although I wasn't able to find any data on civil aviators and their perception or understanding of military airspace, I've learned through conversations that they're all too often unaware. Even frequent flyers who went through pilot training with me later expressed their horror at how dangerous flying through MOAs really is, and unfortunately, how often it's done by those less informed.

It's ironic that as we plunge forward through the 21st century and continue to add more toys to our jets, we find ourselves at risk from one of the most basic aspects of flying.

The price of our new fighters is so high that our government simply can't afford to buy the quantities of aircraft it once bought. The loss of an F-22 or F-35 would be a substantial blow to our nation's war-fighting abilities, not to mention the immeasurable cost of losing lives.

It's time we took a twofold approach to attack this issue. First, we must reach out to civil aviators and educate them on just how dangerous it is to fly through MOAs unannounced. Second, we must go back to the basics, pull our heads out of the drool bucket, and clear for other aircraft, to prevent an unnecessary "there-I-was" story.

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

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

Crew of Clean 38
168th Air Refueling Wing
Eielson AFB, Alaska

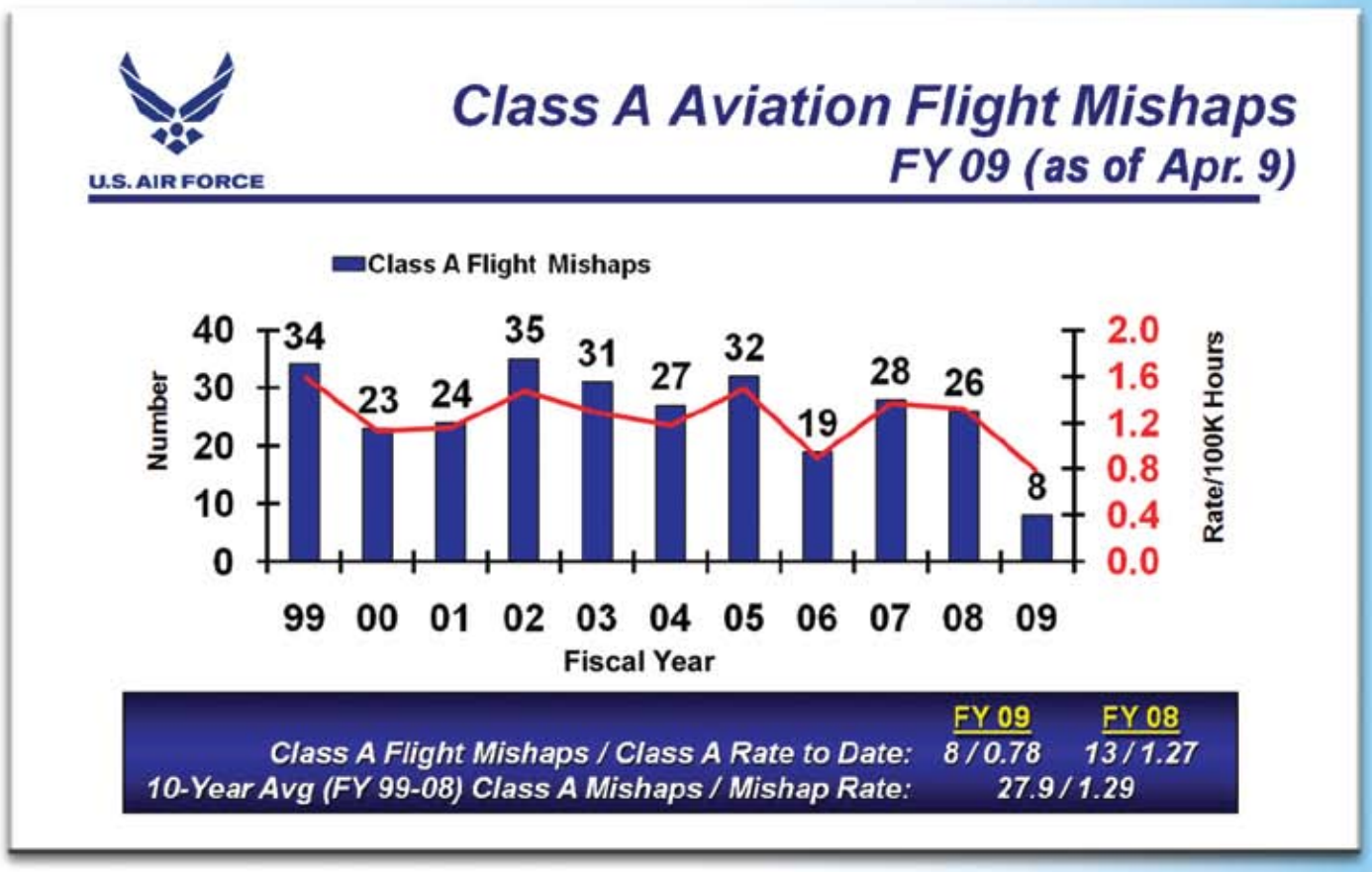
On April 30, 2008, KC-135 crew "Clean 38" was scheduled to provide refueling support for an F-22 ("Raptor 1") delivery from Hill AFB, Utah, to Elmendorf AFB, Alaska. While established on the altitude reservation, Raptor 1 developed multiple emergencies that led to lost instrument and transponder capability, limited navigation capability, and limited communication on a single radio. Clean 38 quickly coordinated with air traffic control for an emergency return to Hill AFB, and flew airspeeds and altitudes commensurate with emergency procedures for Raptor 1. En route, Clean 38 notified supervision, acquired weather and divert locations, and coordinated for fighter chase support. These timely actions allowed Raptor 1 to make critical decisions and reduced the time spent in the weather, flying formation with Clean 38. Approaching Hill AFB, Raptor 1 experienced two more emergencies that directed landing as soon as possible. With Raptor 1 on the wing, Clean 38 immediately coordinated and began a descent through instrument meteorological conditions. The formation broke out of the weather 12 miles from the field, and Clean 38 coordinated landing clearance, resulting in the safe recovery of Raptor 1. The crew members of Clean 38 were essential in the safe recovery of a multimillion-dollar combat asset. Their superior skill and ability to perform under extreme circumstances reflect great credit upon themselves, Air Mobility Command, and the United States Air Force.

Capt. Benjamin Griffith
81st Expeditionary Fighter Squadron
Bagram Air Base, Afghanistan

On April 25, 2008, during combat operations, after successfully lasing two guided weapons to their targets and during a subsequent 30 millimeter high-angle strafe pass, Capt. Griffith experienced a catastrophic engine failure and subsequent loss of thrust in his A-10. With the aircraft nose 30 degrees below the horizon and in mountainous terrain, Capt. Griffith expertly completed an escape maneuver to avoid weapons fragmentation, advised his wingman of the emergency, and directed the flight away from the border. With one engine out, the aircraft was unable to sustain level flight more than 2,000 feet above the terrain. Capt. Griffith led the flight toward the nearest divert field while employing solid emergency procedures. Upon reaching a lower altitude and with a clear path to the divert field, Capt. Griffith elected to retain his external stores and successfully performed a single-engine approach and landing with night vision goggles at an unfamiliar airfield, in winds gusting more than 25 knots. The outstanding leadership and superior skill displayed by Capt. Griffith under extreme circumstances reflect great credit upon himself, United States Air Forces in Europe, and the United States Air Force.

Capt. Jeffrey A. Schneider
13th Fighter Squadron
Misawa Air Base, Japan

On July 28, 2008, Capt. Schneider led a two-ship F-16 sortie, call signs Rabid 11 and 12, from Misawa AB. During the sortie, Misawa initiated a weather recall. Because of his weather category rating, Capt. Schneider placed Rabid 12 in the lead during the instrument recovery to ensure he could provide better mutual support in case his wingman had to divert. At about eight miles on final, Rabid 12 received spurious instrument landing system command steering information, then lost all steering information in his head-up display. Rabid 12 correctly transitioned to his backup attitude director indicator but was unaware that this instrument had also failed and was displaying false information. Still in the weather and assuming he was well above glide path, Rabid 12 unknowingly followed the erroneous glide slope guidance and increased his rate of descent. Capt. Schneider noticed Rabid 12 going below glide path and asked him to confirm his position. Controllers advised Rabid 12 he was showing below glide path, and Capt. Schneider immediately directed Rabid 12 to pull up. Rabid 12 initiated a "go-around," bottoming out at 400 feet, 3.5 miles off the end of the runway. Capt. Schneider's excellent flight leadership and situational awareness directly prevented a catastrophic mishap and resulted in the safe, uneventful recovery of his wingman and aircraft. The outstanding airmanship displayed by Capt. Schneider reflects great credit upon himself, Pacific Air Forces, and the United States Air Force.



Summary of FY09 Class A Aviation Flight Mishaps

Date		Type	Description
Nov 12	✈	F-16C	Engine fire; aborted takeoff; departed runway
Nov 13		F-15C	Departed runway during landing
Jan 16		HH-60G	Ground impact; severely damaged
Jan 30		C-17A	Landed gear up; undercarriage damage
Mar 25	✈	F-22	Crashed; destroyed; pilot fatality

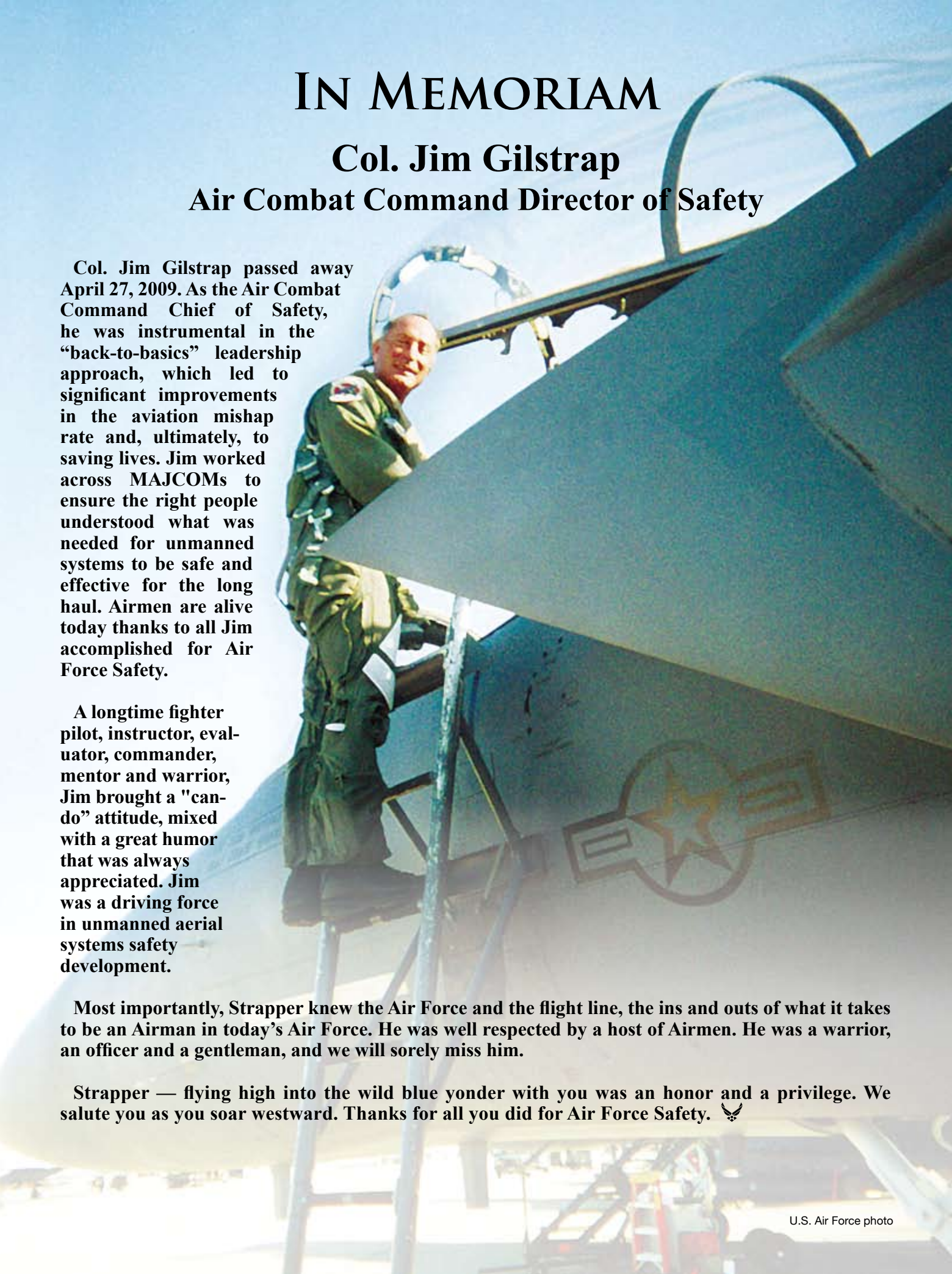
Summary of FY09 Global Hawk / Predator / Reaper Class A Mishaps

Date		Type	Description
Nov 02	✈	MQ-1B	Crashed after takeoff
Dec 04	✈	MQ-1B	Electrical malfunction; destroyed during landing
Feb 07	✈	MQ-1B	Engine failed; lost link; crashed
Feb 22	✈	MQ-1B	Lost link; destroyed

✈ Denotes destroyed aircraft

In Memoriam

Col. Jim Gilstrap
Air Combat Command Director of Safety



Col. Jim Gilstrap passed away April 27, 2009. As the Air Combat Command Chief of Safety, he was instrumental in the "back-to-basics" leadership approach, which led to significant improvements in the aviation mishap rate and, ultimately, to saving lives. Jim worked across MAJCOMs to ensure the right people understood what was needed for unmanned systems to be safe and effective for the long haul. Airmen are alive today thanks to all Jim accomplished for Air Force Safety.

A longtime fighter pilot, instructor, evaluator, commander, mentor and warrior, Jim brought a "can-do" attitude, mixed with a great humor that was always appreciated. Jim was a driving force in unmanned aerial systems safety development.

Most importantly, Strapper knew the Air Force and the flight line, the ins and outs of what it takes to be an Airman in today's Air Force. He was well respected by a host of Airmen. He was a warrior, an officer and a gentleman, and we will sorely miss him.

Strapper — flying high into the wild blue yonder with you was an honor and a privilege. We salute you as you soar westward. Thanks for all you did for Air Force Safety.

U.S. Air Force photo