Volume 4, Number 1 Winter 2011

WINGMAN

Airmen Taking Care Of Airmen

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

AFSSs: The Future of Space Flight Safety

It's Your Night Out

BASH Risk

UXO Safety and You

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

The Safety Attitude

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

I'm honored and humbled to serve as your Air Force chief of safety and commander of the Air Force Safety Center. While I've only been in the job a few months, visited a few locations and attended what seems like a multitude of meetings, I'm excited about the opportunities we have to prevent mishaps.

I look forward to meeting all of you to learn more about what I can do to make your lives easier in our joint quest to preserve combat capability. I want to hear your ideas. I'm sure you've heard the saying, "Safety is an attitude." An attitude that makes us want to go the extra step. Safety is an attitude that lets us know that safety is NO accident.

I thought about this safety attitude during my final flight as the 19th Air Force commander. This was my last flight, one day before my change of command ceremony. One day before becoming the Air Force chief of safety. I was the lead pilot of a two-ship departing Randolph AFB, Texas, for Columbus AFB, Miss. Our briefing covered our risk management (RM) items and our risk factors for this sortie were low. Except for some clouds in the vicinity of Randolph, the weather was VFR all the way to Columbus. Takeoff weather was overcast — a 200-foot ceiling with two nautical miles visibility. The runway was dry. We briefed a formation takeoff due to the low ceiling. Ground operations went as planned and we took the runway for an on-time departure. We ran up our engines and released brakes. Once airborne, I glanced over at #2 to make sure his gear and flaps had retracted. He looked good. As I looked forward, I saw a flock of birds and heard several thumps as some hit my aircraft. My right engine seized. My wingman confirmed that a flash fire had come out of my right engine exhaust. Our NORMAL low-risk cross-country flight had just changed.

Now I began to use all the experience I had gained from the emergency simulator training I received throughout my flying career. As I entered the clouds and reverted to instrument flying, I treated this emergency just like the many similar scenarios I had seen in the simulator. I left my left engine in afterburner and continued to climb away from the ground. I monitored my left engine instruments to make sure the engine was still operating (I knew I couldn't restart the right engine since it had seized and was severely damaged). I also prepared for a possible ejection. During my simulator training, the instructor pilot would usually fail the left engine at this time, which would require an ejection, or leave the left engine running so I could practice a heavyweight single-engine approach in poor weather. Today, the engine stayed operating so I prepared for the single-engine approach.

The weather cleared slightly at 4,000 feet so I leveled off and had my wingman check my aircraft for damage. He monitored my aircraft as I performed several checklist procedures that, until today, I had only accomplished in the simulator. They included: Engine Shutdown, Single-Engine Landing, Single-Engine Go-Around, Before Ejection Checklists plus a few more. Once complete, I configured my aircraft for landing and cleared my wingman off prior to entering the bad weather for my instrument approach.

Now the mission got even more exciting! A thunderstorm had moved over the field and Tower was calling the runway "wet." The ceiling and visibility were also decreasing since my initial takeoff. As each minute passed, it seemed the traffic controllers were giving progressively worse news about the deteriorating weather. Again, I relied on my simulator training and proceeded to fly my instrument approach. I broke out of the clouds at my weather category minimums and saw the runway. The rain was now a downpour. I touched down in the first 100 feet of the runway, relaxed slightly, but knew from my training that the sortie wasn't over. Now I would have to stop this heavyweight T-38 on a wet runway, in pouring rain and without anti-skid braking. I tried to aero brake but the winds and weight of the aircraft, due to the high fuel load and travel pod, made it almost impossible. I lowered the nose to the runway and monitored my speed as well as the runway distance remaining markers. I knew if I hit the brakes above 100 knots, I had a high chance of blowing the tires. I was hydroplaning down the runway and my aircraft was barely decelerating. With 4,000 feet of runway remaining, I was still at 120 knots. Because I was not slowing down, I decided to start braking. After several seconds, my left tire failed and I immediately began to veer off to the left side of the runway. Again, I used my training experience and applied asymmetric braking to keep the aircraft on the runway. As I slowed down, I was able to use nose-wheel steering and my aircraft came to a stop approximately 1,000 feet from the end of the runway. I was finally able to relax and wait for the emergency vehicles to respond.

You may wonder why I'm telling this story. There are several lessons I reaffirmed from that early morning sortie. First, always prepare using RM. Risk management should be incorporated in everything we do. Second, the training we receive in our Air Force is second to none. Because of the training we receive from our outstanding instructors, we're able to perform in the worst situations. Finally, always be prepared for the unexpected and never think "it can't happen to me!" This was my last day of flying the T-38 — so what could go wrong?

I'm proud to join a team that delivered results such as: FY09 being the safest year in aviation history, low off-duty fatal mishap rates during the last Thanksgiving-to-New Year's holiday season, the lowest number of fatalities recorded during a Critical Days of Summer campaign since 1988 and the list goes on. Commanders, supervisors, Airmen, family members and, most importantly, safety professionals all deserve great credit for the significant accomplishments in recent years.

While there has been a change of command in the safety world, we'll continue to build existing programs and initiate new programs. Preserving combat capabilities will continue to be our top priority. I can think of no greater privilege than to be the chief of safety and I look forward to working with you. Remember, Air Force Safety is NO accident. ★★

Illustration by Dan Harman

Spotlight on the Office of the Staff Judge Advocate

COL. DANIEL M. VADNAIS
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The Air Force Safety Center Office of the Staff Judge Advocate (AFSC/JA), or Legal Office, is one of the smallest offices in the Safety Center, but has the broadest scope. The staff provides legal advice and general counsel to each of the Safety Center's divisions. Support ranges from aviation mishap investigations and ground safety programs to military law, civil law, labor law, contracts, ethics matters and many other issues that arise daily.

The mission of the Staff Judge Advocate (SJA) is to provide well-reasoned, sound legal advice and general counsel to the Air Force chief of safety, the Air Force Safety Center and Air Force safety officials at all levels so they can establish and execute mishap prevention programs to enhance Air Force mission capability.

Counsel takes the form of advising a wide range of individuals, from major command, wing and unit chiefs of safety to contracting officials and SJAs. It also involves advising safety investigation board and accident investigation board presidents on the proper use and limitations of Department of Defense (DOD) safety privilege. Investigations include aviation, ground, weapons, space — and even afloat — mishaps.

The SJA also addresses legal and safety issues with the Office of the Secretary of Defense, coordinates between other U.S. armed services, federal agencies and international safety programs and responds to requests for safety information from Congress and under the Freedom of Information Act.

AFSC/JA maintains a library of over 18,000 aviation mishaps dating back to 1956.

Each year, Safety Center attorneys teach approximately 36 classes all over the world on DOD Safety Privilege to safety and accident investigation board presidents, wing chiefs of safety and judge advocates.

Overall, the Air Force Safety Center Legal Office, although small in size, provides critical legal support at all levels in support of the safety mission.

Zombie Satellites

BRIAN WEEDEN
Secure World Foundation
Superior, Colo.

Photo: Stockbyte Image

On April 8, 2010, news broke that the world's largest provider of fixed-satellite services, Intelsat S.A., lost contact with one of its approximately 50 geosynchronous satellites, Galaxy 15.[1] The cause of the malfunction is not known, although it could've been due to a space weather event caused by a solar storm.[2] Because of the malfunction, Intelsat was no longer able to maneuver Galaxy 15 to stay at its assigned location over the equator, roughly between Hawaii and the West Coast. Thus, the gravity perturbations of the Earth started to slowly pull Galaxy 15 east toward the U.S. Unfortunately, Galaxy 15's receiver and transmitter equipment were still functioning, meaning it could pick up and rebroadcast signals aimed at other satellites as it drifted past. Like an open microphone and sound system in a crowded room, Galaxy 15's unwanted rebroadcasts could cause serious radio frequency interference. Galaxy 15's slow, lumbering threat to other satellites and "mostly dead" status earned it the nickname "Zombiesat" from the media.

Over Memorial Day weekend and through the first week of June, Galaxy 15 drifted through the orbital slot of AMC 11, a satellite that relays programming from several prominent television networks to more than 100 cable television systems across the U.S., Canada and the Caribbean.[3] A complicated mitigation plan was put in place that successfully prevented any disruption to these services. Over the next weeks and months, Galaxy 15 will continue to drift east, presenting an interference threat to several more satellites along the way.[4]

Eventually Galaxy 15 will lose its ability to keep its solar panels aligned with the sun. Once that happens, it'll no longer be able to keep its batteries charged.

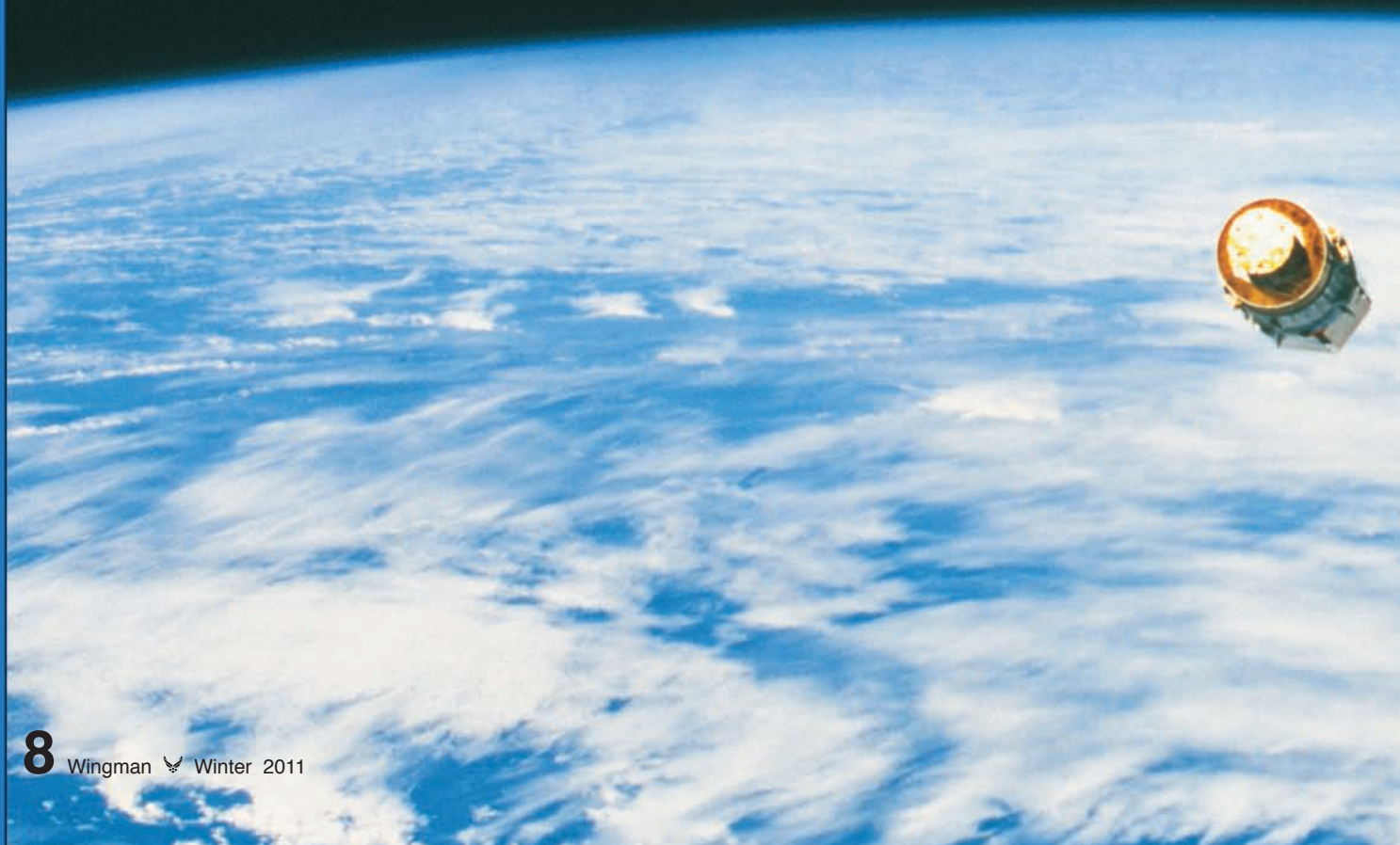
The satellite will then lose electrical power and cease to be a radio frequency interference threat. However, the completely dead satellite will continue to drift back and forth through the geostationary belt above North America for decades — possibly centuries — posing a navigation hazard to all operational satellites in that region. The owners of these satellites will need to continually monitor the position of Galaxy 15 and be prepared to maneuver to avoid potential collisions.

Satellite failures in geostationary orbit aren't a new occurrence. On average, about one satellite fails per year in the active geostationary belt. Unfortunately, the world currently lacks the capability to either fix these satellites or move them out of the active belt to a disposal region where they won't present a collision threat.[5] The technology to eventually provide these capabilities, called on-orbit servicing (OOS) and orbital debris removal (ODR), is currently being developed in the U.S., Canada, Europe and elsewhere.[6] Eventually, we may be able to diagnose satellite failures, remove dead satellites and debris or even refuel or repair a satellite in orbit.

There is a danger to developing these capabilities, as some could also be used to deliberately damage or destroy satellites. This dual-use nature means that development and operational use of OOS and ODR capabilities could create serious issues of trust between the many countries that operate satellites. Thus, there is a need to develop and, more importantly, use these capabilities in as open and transparent manner as possible to provide the necessary confidence that it's being done for peaceful purposes, as laid down in the Outer Space Treaty. This can be done in a number of ways.

Developing enhanced and integrated space situational awareness capabilities in many countries can allow for independent verification that OOS and ODR activities

"The security, sustainability and free access to, and use of, space is vital to U.S. national interests."



are being accomplished for peaceful purposes. And while export controls and intellectual property rights will mean that some of the technology used for OOS and ODR will be controlled by certain countries, there can still be cooperation and communication through briefings on planned activities and the selection of objects to be removed or serviced.

On June 28, 2010, the White House released the new U.S. National Space Policy that outlines the goals and priorities for all U.S. activities in space.[7] The policy states that "the security, sustainability and free access to, and use of, space is vital to U.S. national interests." It also calls on all nations to "act responsibly in space and help prevent mishaps, misperceptions and mistrust." Developing OOS and ODR capabilities in an open and transparent manner will help fulfill all of these important goals and ensure that all nations can continue to use space for the foreseeable future.

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"Act responsibly in space and help prevent mishaps, misperceptions and mistrust."

U.S. National Space Policy

Photo: Stockbyte Image

AFSSs: The Future of Space Flight Safety

RAYMOND E. EBBS
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We've all heard statements like, "We must learn to do more with less." Every year it gets more difficult to accomplish this challenging task given the constrained fiscal environment. However, we can't quit trying to find better ways to operate. Advances in technology, cultural changes and the brilliant minds of our people will continue to help us find better ways of completing the mission. One such effort to reduce the cost of space flight safety is the use of autonomous flight safety systems (AFSSs).

Department of Defense (DOD) Directive 3200.11, *Major Range and Test Facility Base*, designates major range and test facility bases as national assets that "shall be sized, operated and maintained" to provide a broad base of test and evaluation (T&E) capabilities sufficient to support the full spectrum of DOD T&E requirements. In order to meet this policy, national ranges maintain a variety of assets, such as fixed and mobile radars, telemetry dishes, optics, weather towers and airfields. These assets, however, are becoming more difficult to operate and maintain due to shrinking range budgets and aging equipment. AFSSs may provide a way to reduce the cost of operating national ranges. An AFSS is not a design solution to meet range safety requirements, but a different approach to meeting these requirements and solving the space flight safety problem.

What is space flight safety and why is it so important? Space flight safety consists of the processes, procedures and analyses performed by range safety personnel to protect resources from the hazards associated with launch and test operations. What are the hazards and how dangerous are they? Large space-launch vehicles, like the Atlas V and Delta IV, and their payloads weigh over 1.5 million pounds. These vehicles contain large quantities of potentially dangerous propellants. Although rare, vehicle launch failures or malfunctions can result in vehicle breakup or intact ground impact. This, in turn, can produce inert and explosive debris, chemical toxicity when propellants are released in the atmosphere and blast overpressure. These can threaten the lives of people and result in the destruction of resources on and off the military installation.

Space flight safety's job is to contain these hazards and isolate them from populated areas wherever practical. If containing and isolating these hazards aren't possible, flight safety staff identify the risks to populations and provide this risk assessment to the appropriate risk acceptance decision maker in order to obtain a go/no-go for launch. Hazard mitigation is accomplished by relocating people on base to safe locations and employing flight safety systems (FSSs) to prevent hazards from reaching populated areas. An FSS consists of equipment required to track a launch vehicle, monitor vehicle performance and a flight termination system (FTS). The FTS, a subset of the FSS, is a method to allow launch range personnel to maintain positive control over the vehicle and can include launch vehicle thrust termination (shutting down the engines so the vehicle cannot fly out of control), activation of explosives on the vehicle to break it up or aerodynamic control surface manipulation to prevent debris, chemicals and blasts from reaching off-base populations.

Most national ranges employ a relatively large inventory of ground assets and equipment to receive destruct commands on the vehicle. Vehicle tracking and performance data is provided visually in near-real time to a flight control officer (FCO) to assess and determine if a vehicle needs to be destroyed to protect the public and other valuable resources. These ground assets, including the training and certification of FCOs, are becoming increasingly costly to operate and maintain;

U.S. Air Force photo by Patrick H. Corkery

therefore, alternative approaches to flight safety are needed. One approach is an AFSS.

An AFSS is an airborne system that is self-sufficient and can independently initiate commands to perform flight termination of an errant launch vehicle without the aid of ground assets and a human-in-the-loop. An AFSS uses software containing flight termination criteria based on safety and risk analyses and, if necessary, generates commands to terminate thrust, direct the vehicle to a safe, unpopulated area or destruct the vehicle. A typical AFSS would employ redundant onboard navigation sensors and flight processors to continuously monitor the position and performance of the vehicle.

AFSSs and autonomous FTSs (AFTSs) are not entirely new concepts. AFTSs have been successfully employed in similar operations on Russian boosters, Israeli Arrow intercept missiles and launch vehicles flown by Sea Launch. In addition, NASA has an ongoing AFSS development program. Although there are significant benefits associated with an AFSS, it isn't a panacea to the range infrastructure cost problem; therefore, it's essential that we examine some of the more important pros and cons of AFSSs.

AFSS Pros

Since AFSSs are self-sufficient onboard systems, there is no need for range ground assets for flight termination purposes. This significantly reduces range infrastructure and manpower costs. AFSSs don't require ground radars for tracking a vehicle, telemetry sites to receive vehicle performance, an uplink capability to the launch vehicle FTS or an FCO.

AFSSs can react faster than human-in-the-loop systems due to human reaction time delays and the absence of communication. A faster response time allows destruct lines (DLs), designed to protect populations and resources, to be moved closer to protected/populated areas (impact limit lines, or ILLs). This allows an errant vehicle more time to recover and successfully complete a mission or provides more time to collect valuable data for anomaly analysis (see Figure 1). In addition, moving the DLs closer to protected areas allows for a wider range of vehicle trajectories.

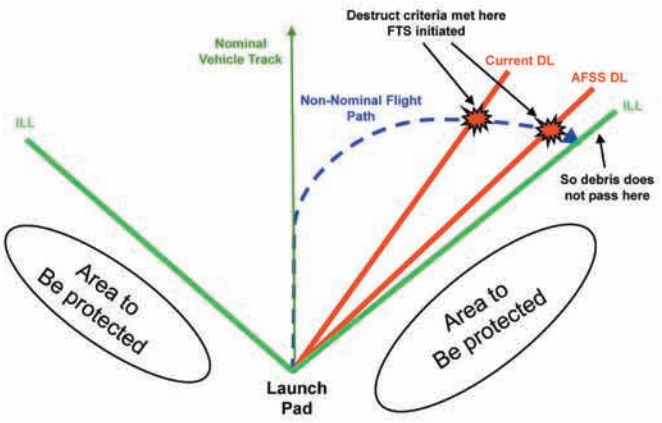


Figure 1. Destruct and Impact Limit Lines

Rapid response launches, such as the Operationally Responsive Space (ORS) Program, could benefit from an AFSS. ORS is designed to provide affordable, rapid reaction (responsive spacecraft, spacelift and ground processing) capability to the warfighter. Under the ORS launch concept, spacelift would consist of on-call, ready-to-field assets capable of launching in days or weeks rather than the months it takes to process and execute our current space launch programs.

AFSS Cons

An area of concern with an AFSS is the destruction of a good vehicle. Unexpected or unplanned launch vehicle events may not mean the vehicle will endanger the public. Current FSSs provide data and visual information to the FCO who can determine if an erratic vehicle threatens a populated area. If it doesn't threaten a populated area, the FCO can allow the vehicle to continue flight so the launch operator can collect valuable flight data to aid in fixing what caused the erratic flight. Thus, AFSS software should allow errant, but stable, flight to continue for data collection purposes where public safety considerations allow.

An AFSS requires software capable of evaluating complex mission rules, safety criteria and numerous flight scenarios associated with space flight. Although certainly achievable, allowing launch operators to develop their own AFSS software could present a non-trivial problem. Numerous software systems, different algorithms and different coding language developed by companies with varying degrees of range safety experience could place an additional significant responsibility on the ranges and their range safety offices.

Some space launch programs, especially manned spaceflight, may initially be uncomfortable using AFSSs, thus requiring the ranges to maintain both the current ground-based FSSs and AFSSs.

Development and operational costs of AFSSs are currently unknown and need to be investigated to determine their cost effectiveness. In addition, new concepts of operation will need to be developed to allow ground certification of onboard tracking systems used for in-flight safety decisions.

AFSSs have the potential for removing dependence on launch range ground infrastructure for space flight safety and don't require radars, radio frequency communication and command links, data processing equipment or trained and certified humans to destruct errant launch vehicles as our current range safety systems do today. In the fiscally constrained environment that we currently operate in, AFSSs continue to advance in technical maturity and reliability, offering potential solutions to challenging problems.

It's Your Night Out!

ROD KRAUSE
5th Bomb Wing
Minot AFB, N.D.

It's 1 a.m., and you've got to be up and at 'em by 7 a.m. The problem is you're toasted. You've had the time of your life and drank enough alcohol to keep you happy until 10 a.m. the next day! Somewhere in the fog reality begins to strike. You've got to get home. You look around — your friends are toasted, too. You draw sticks and hope for the best. Darn, you "won."

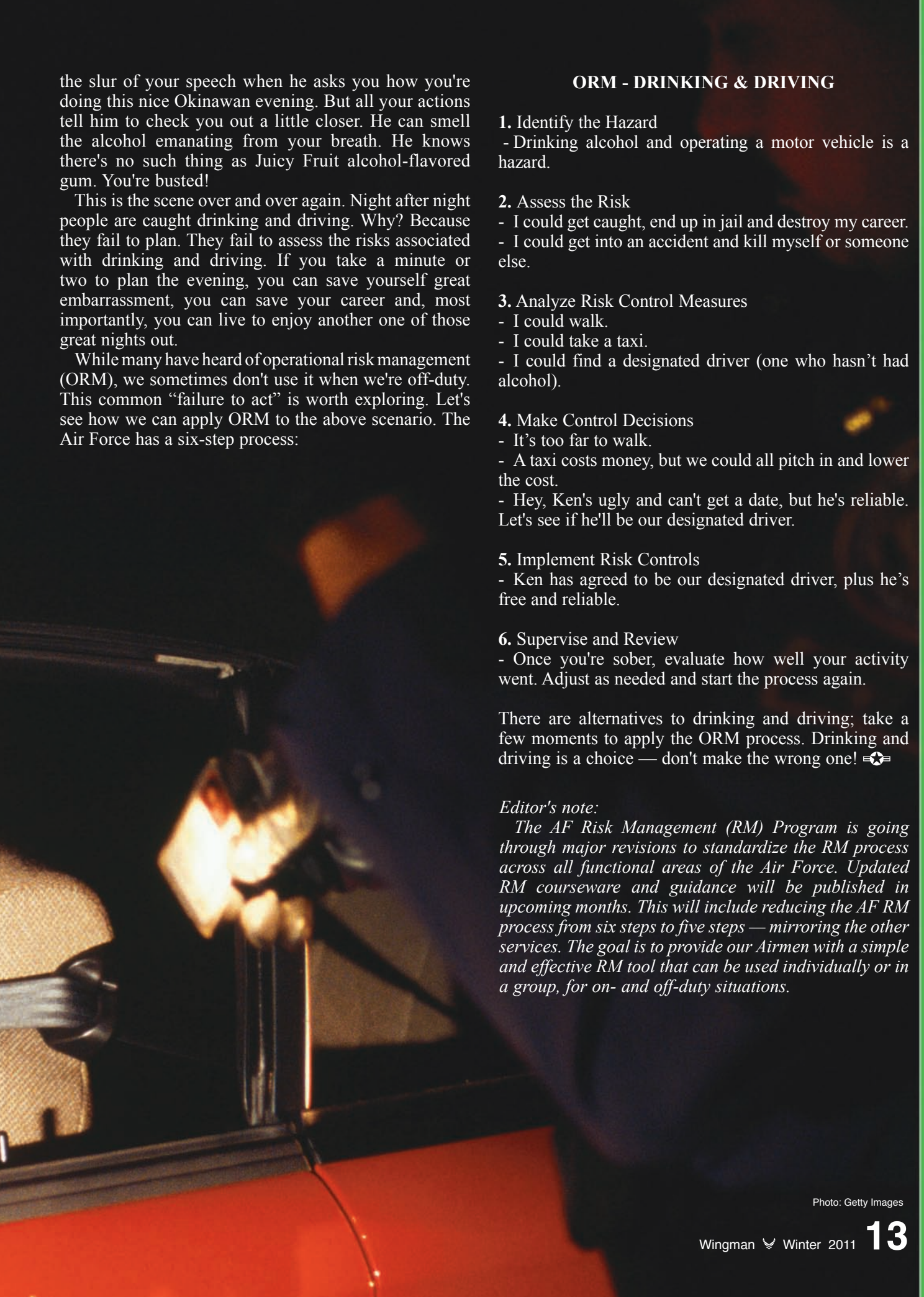
You're thinking it's only a couple of miles to the front gate, and you don't feel THAT drunk. You toss a stick of gum in your mouth and off you go. As you approach the gate, you fumble for your ID card. You're thinking if you could just get through the gate, you'd be home free! You're hoping for that quickie ID check and a friendly wave to proceed. As you hand the guard your ID card, he's observing your every move. He noticed the way you approached the gate, weaving while fumbling for your ID card. He notices your glossy pupils and the way your eyes fail to focus. He notices

He knows there's no such thing as Juicy Fruit alcohol-flavored gum. You're busted!

the slur of your speech when he asks you how you're doing this nice Okinawan evening. But all your actions tell him to check you out a little closer. He can smell the alcohol emanating from your breath. He knows there's no such thing as Juicy Fruit alcohol-flavored gum. You're busted!

This is the scene over and over again. Night after night people are caught drinking and driving. Why? Because they fail to plan. They fail to assess the risks associated with drinking and driving. If you take a minute or two to plan the evening, you can save yourself great embarrassment, you can save your career and, most importantly, you can live to enjoy another one of those great nights out.

While many have heard of operational risk management (ORM), we sometimes don't use it when we're off-duty. This common "failure to act" is worth exploring. Let's see how we can apply ORM to the above scenario. The Air Force has a six-step process:



ORM - DRINKING & DRIVING

1. Identify the Hazard
- Drinking alcohol and operating a motor vehicle is a hazard.

2. Assess the Risk
- I could get caught, end up in jail and destroy my career.
- I could get into an accident and kill myself or someone else.

3. Analyze Risk Control Measures
- I could walk.
- I could take a taxi.
- I could find a designated driver (one who hasn't had alcohol).

4. Make Control Decisions
- It's too far to walk.
- A taxi costs money, but we could all pitch in and lower the cost.
- Hey, Ken's ugly and can't get a date, but he's reliable. Let's see if he'll be our designated driver.

5. Implement Risk Controls
- Ken has agreed to be our designated driver, plus he's free and reliable.

6. Supervise and Review
- Once you're sober, evaluate how well your activity went. Adjust as needed and start the process again.

There are alternatives to drinking and driving; take a few moments to apply the ORM process. Drinking and driving is a choice — don't make the wrong one!

Editor's note:

The AF Risk Management (RM) Program is going through major revisions to standardize the RM process across all functional areas of the Air Force. Updated RM courseware and guidance will be published in upcoming months. This will include reducing the AF RM process from six steps to five steps — mirroring the other services. The goal is to provide our Airmen with a simple and effective RM tool that can be used individually or in a group, for on- and off-duty situations.

Photo: Getty Images

The Invisible Sli

ANONYMOUS

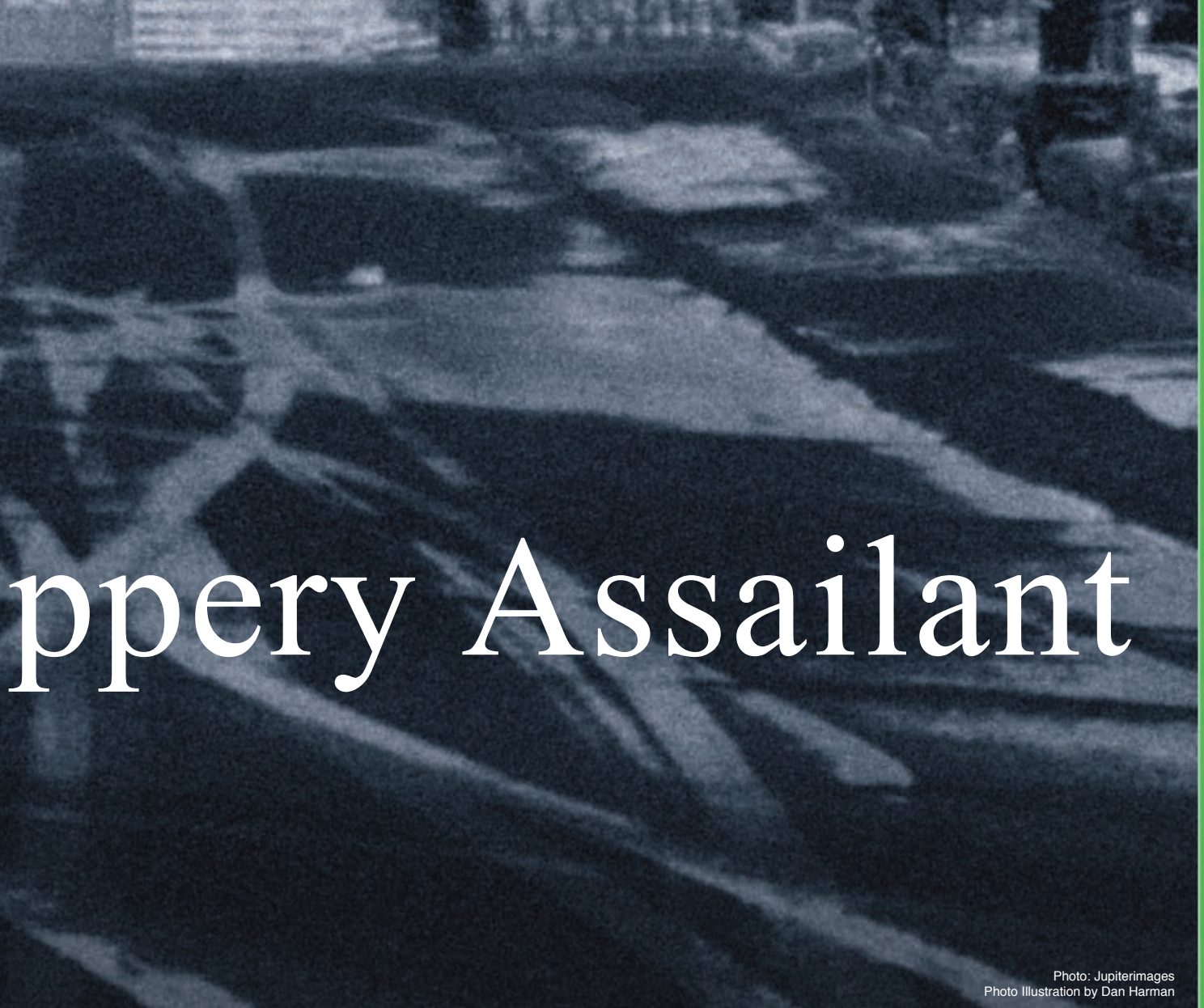
Although I've lived almost half my life in Pennsylvania, I had never heard the term "black ice" until I moved to northern Maine in the summer of 1995.

Some of the locals thought it was humorous that I had never experienced "their" type of winters and would jokingly try to warn me what I was in store for: whiteouts, towering piles of snow, plugging your car in at night to keep the engine heated (which didn't always work), sharing the road with snowmobiles, digging your car out of 2, 3 or even 4 feet of snow (especially after the roads were plowed) and dealing with the dreaded black ice.

I lived in Maine for two winters. I saw many cars sliding and skidding on straight roads and down hills. I first experienced black ice driving home from work one day on Route 1 as I was trying to stop at a red light. I was on a straight, even roadway, but I apparently tried to apply my brakes a little harder than I should have. I skidded through the light and halfway into the intersection. It scared the daylights out of me! Thank goodness I was the first car in line and there wasn't any cross traffic at the time.

Living in Maine, you don't experience anything just once. On multiple cold, winter mornings on my way to work, I'd usually hit black ice going down the hill from my apartment complex. As an added bonus, it was sometimes accompanied by frozen brakes. At the bottom of the hill was Route 1, so you can imagine my fear as I slid uncontrollably toward highway traffic. Luckily, my car would slow to a stop just short of the stop sign.

For those living with black ice, here are a few tips I've picked up along the way:



ppery Assailant

Photo: Jupiterimages
Photo Illustration by Dan Harman

1. Black ice can fool drivers into thinking it's just standing water on the road's surface. Condensation freezes when the temperature is 32 degrees or below and forms a thin layer of ice. It usually forms from early morning or evening mists or fog. Since there are few trapped air bubbles, it's transparent and difficult to see compared to snow and frozen slush.

2. Black ice can form anywhere, but bridges and overpasses are the most vulnerable because of air circulating above and below the elevated surfaces. This causes the temperature to drop faster than on regular pavement.

3. Black ice doesn't just occur in colder climates. Many areas in the South also have problems with black ice when it gets cold enough. Have you ever watched the news or the Weather Channel when they're showing rush-hour traffic on a wet, cold day in Atlanta, Ga.? Not pretty!

4. Keep plenty of space between your car and the one in front of you. This will allow longer stopping distances on slick roads. Driving slower will also give you more control and traction on the road. If your car starts sliding, remain calm, shift into a lower gear, turn the wheels in the direction you're sliding, take your foot off the gas and lightly tap the brakes. If you're going off the road, try not to steer into things that could cause a lot of damage. The ideal place would be an empty field or a fluffy snowbank.

Finally, when it comes to black ice, don't be fooled into thinking four-wheel-drive SUVs have an advantage over regular cars. They have no additional traction and can spin out of control just as easily as the family sedan. They may be good for driving in heavy snow, but when driving on black ice, they're just as powerless against the "invisible slippery assailant."

Drive safe; arrive alive.

DWF: Driving While Fatigued

STAFF SGT. L. D. DAVIS
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Do you remember sitting through pre-departure briefings, having numerous safety campaigns and receiving safety briefings before long weekends? I've gone through many and can almost remember every word said. There were times when I found them to be very annoying because it was like beating a dead horse; yet, I've had countless close calls when it comes to safety. I look back now and just wonder what I was thinking during some of those times.

When I was a single airman first class with a very close relationship with my family, I had never really been separated from my mother or any of my siblings for longer than two weeks. After technical school I received an assignment to Texas — 15 hours from my family. I realized I wasn't going to be able to go home on the weekends. I had to carefully plan each trip before I went home; unfortunately, I didn't plan as well as I should have.

When you're homesick, there's not much that can keep you from going back and seeing the ones you love. I was under the age of 26, so I always had to do a pre-departure briefing and complete the Air Education and Training Command Form 29B, *Pre-Departure Safety Briefing*. My commander made sure that I planned my trip accordingly. I always had plans to stop after driving a certain number of hours, but it never really happened.

Normally I would wake up before 6 a.m., go to physical training, work a full day and immediately get on the highway for the long road trip home. I had to drive a total of eight hours just to get outside Texas. Once I got out of Texas, I always felt like I was just a short drive away from being home. Once I hit the Louisiana state line, I would feel the long trip taking a toll on me. I'd just overlook my fatigue and continue to drive.

Photo: Jupiterimages

There were many times I felt my body just wanting to crash all together, but there was always that little conscience telling me I was only five hours away from home, and I could make it. I always made a point to stop in Vicksburg, Miss., to refuel my car and restock my passenger seat with caffeine. I really thought that would be enough to help me make it to my destination. Even pumped with tons of caffeine I was usually only good for about 20 minutes.

I would feel my eyes getting heavy as I got closer to my home state. I would try rolling down the windows, opening up the sunroof and even turning the radio up extremely loud. But once fatigue sets in, you can and will sleep through anything. Your mind stops functioning, your alertness level decreases, you become easily distracted and you start to forget.

Once, I fell asleep driving down a small two-lane road and felt my vehicle drifting. I woke up just in time before my car was about to go into a ditch. I have to make it to the nearest city, I thought. The next city was 30 minutes away — and that was 35 minutes away from my mother's house. Once I reached that city, I just continued to drive. The next thing I knew I was pulling into my mother's driveway, but I couldn't remember how I got home. I had been up for over 24 hours just trying to make it home. I told myself time after time that I would never do that again.

Although I came close to a mishap each time, I never really had one while driving fatigued. Now that I'm older, I'll say that those trips home while driving fatigued were some of the stupidest actions I've ever taken.

If you ignore signs from your body that you're tired, you can have a fatal mishap. You might not be as lucky as I was. My advice to you: Just take your time and wherever you're trying to get to, it'll still be there after a rest! It's always better to arrive alive than to not arrive at all.

An Ice Fishing Trip I'll Never Forget

STAFF SGT. BRANDON CRUZ
28th Bomb Wing
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I enjoyed the outdoors when I was stationed at Ellsworth AFB, S.D., especially during ice fishing season. During my memorable incident, a cold arctic front had moved in from the North and with it came sub-zero temperatures and a foot of snow. The frigid temperatures hung around for a week and started to warm up by Thursday, giving me the itch to get up in the hills and wet a line.

A buddy and I left the base at 6 a.m. on Saturday and headed into the northern Black Hills for Deerfield Reservoir, known for producing some nice trout. We finally got to the fishing hole, but snow had drifted over the side road making it dangerous to travel on. We turned around, headed back to the main road and then headed north along the shoreline of the reservoir. We pulled into a parking area, but snow had drifted in, so we decided to park along a snowmobile trail and unload our fishing gear.

It was fishing time, but we still had a half-mile hike across the lake to get to our fishing spot. Once there, we got our holes drilled; the ice measured in at 30 inches thick. We quickly got our poles in the water and the fish were biting within minutes. Snowmobilers were passing by all morning. The sun finally came out and created perfect ice fishing conditions. The morning was off to a fairly smooth start.

The daily limit for trout in South Dakota is five fish per fishing license; we both were close to filling our daily limit. We even caught a couple of golden perch — prized fish in the Dakotas. Important to note is that the weather changes quickly; that day was no exception. The weatherman called for breezy conditions, but we were experiencing 20- to 30-mph gusts and a nasty whiteout that limited our visibility. We continued to fish and waited out the whiteout. When it lifted, we had our daily limit of fish, so we quickly packed up our ice fishing gear and started our journey back to our vehicle around 1 p.m.

We finally made it back to our vehicle and noticed that snow had drifted over the road making it impossible to get out to the main road. After looking at the

surroundings and current conditions, we decided to travel along the snowmobile trail. The trail was about 7-feet wide and ran parallel to the main road. Quick thinking was our downfall; we forgot that snowmobiles are a lot lighter than a Honda Ridgeline. As my buddy turned the truck around, we heard a loud thud, and the truck stopped moving. We put the truck in low gear but it didn't even budge, and the tires weren't spinning. We looked at each other in dismay and got out to start shoveling. I asked him if he had a shovel in his vehicle; the reply was a curt "No," making matters even worse. Our options were a two-by-four and our ice fishing scoops — basically a cooking ladle with holes. Since there was no cell phone signal at the reservoir, our only option was to start digging.

After minutes of "shoveling," we noticed that the truck was high-centered on some ice. We finally got the truck off the ice, and the tires actually started to rotate. What we didn't see on the first walkaround was the tow hitch lodged in the hill along the snowmobile trail. We started working on the tow hitch and had enough room to put the tire jack under the hitch, giving us enough clearance to lift the truck off the hill. Our last ditch effort was laying some timber under the tires which gave us enough traction to get the truck out and on the road. Two-and-a-half hours later, we got our truck out and back on the main road. Adding insult to injury, snowmobilers were passing by without offering help. Another truck was 50 yards down the road, whose driver was watching us the whole time. That memory was something I took away with me; I'll never ignore someone else in trouble.

To all ice fishermen: Always take someone with you when you head out ice fishing, always have a survival kit readily available and never forget to pack a shovel. The first thing I did when I got home was put a shovel in my truck.

Photo by Jochen Sand

Photo Illustration by Dan Harman

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Ladder Mishap

On a cool, February morning, Airman 1 (A1) was working at a family-owned business while off-duty. While repairing holes in the building's roof, A1 climbed up and down a ladder several times. On the last trip off the roof, A1 stepped on the second rung from the top, the ladder shifted, and A1 fell 10 feet to a concrete pad. A1 suffered head and spinal injuries and was left paralyzed below the waist. Alcohol and fatigue were not factors in this mishap.

Lessons Learned

A1 failed to follow good risk management principles and made some errors in judgment that led to this mishap. During the investigation, it was discovered that the ladder had a damaged rail that prevented the ladder from standing properly. A1 knew of the damage and had used the ladder in this condition several times before. If a ladder is damaged and cannot work as designed, the proper thing to do is remove it from service and destroy it so no one else can use

it unsuspectingly. Working with damaged equipment or taking chances and shortcuts may not cause you harm every time, but it increases the likelihood that something could go wrong — eventually the odds will catch up with you. A1 also stepped on the second rung from the top of the ladder on that day. Proper positioning and extension of the ladder would have prevented this from happening and lessened the chance that the ladder would shift. Always extend the ladder at least 3 feet above the ledge where the top is resting and ensure the ladder is at the proper angle (1 foot out at the base for every 4 feet of ladder height to top rest point). Also, remember you shouldn't climb a ladder without a spotter. All manufacturers recommend that someone secures the base while others are on the ladder. Follow the rules when fixing the roof or putting up Christmas lights and get back down safely.

Railroad Crossing Launch

Early on a January morning, Airmen 1, 2 and 3 (A1, A2, A3) were returning to base from a nightclub. They were on a narrow, winding, two-lane road with a 55-mph speed limit. Along the route is a dangerous railroad crossing highlighted in all the safety briefings — crossing it at too high a speed would cause the vehicle to become airborne. A1 was the designated driver (although A1 consumed alcohol). A2 was the owner of the vehicle and the front seat passenger. A3 was a friend and a passenger in the back seat. A1 was travelling along the route at about 90 mph and realized too late that the railroad crossing was fast approaching. A1 braked hard, but the brakes were not in good condition and didn't slow the vehicle enough before it hit the crossing. The vehicle became airborne for about 40 feet and, when it hit the ground, slid more than 250 feet before striking a tree. A1 and A3 suffered severe injuries, and A2 was ejected from the vehicle and died at the scene. Alcohol and fatigue were factors in this mishap.

Lessons Learned

Poor risk management was just one of many factors in this mishap. Because of financial considerations, A2 chose not to get the brakes repaired as recommended. Along with the brake problems, the speedometer was also inoperable. The combination of fatigue (over 20 hours awake at mishap time), the use of alcohol (the one person in the vehicle who wasn't drinking wasn't driving) and the poor condition of the vehicle led to this deadly mishap. We all know that money is tight for young Airmen, but operating a vehicle not in optimal condition substantially increases your risks. Drinking and driving is never a good idea, and you're not being a good wingman if you allow others to drive while impaired when you aren't. Fatigue also leads to problematic decision making. Combine alcohol with fatigue, and you have a recipe for disaster. If you're the designated driver, don't drink. If you see others intending to drive after they drink, step in, step up and be a good wingman. Follow good risk management principles and make a plan where everyone can get home safely.

Hunting Safety

On a cold, December morning, Airmen 1, 2 and 3 (A1, A2, A3) and their dogs left the base to go duck hunting down at the river. The Airmen had hunted together before and had years of experience. As they arrived at the river, they realized some other hunters had taken the

spot that they had intended to use. They decided to move further down the river and found another spot to hunt. The relocation caused them to still be setting up when the official start of the season began. Because shooting had already begun, the Airmen loaded their shotguns in case an opportunity for a shot arose. A1 and A2 placed their guns on the ground and waded into the river to put some decoys out. The combination of other hunters shooting and the Airmen wading in the river caused the dogs to become excited so A3 let them off the leash. As A1 and A2 returned to shore, one of the dogs stepped on A2's 12-gauge shotgun, causing it to fire. A1 was struck in the head from the blast and perished at the scene. Alcohol and fatigue were not factors in this mishap.

Lessons Learned

All the Airmen were experienced hunters, but even they can make mistakes if they don't follow sound risk management principles. The Airmen left the base with enough time to be in the blind, and, if everything had gone as planned, they would have been all set up and ready to go at shoot time. Seldom, though, does everything go as planned. Relocating to a different hunting spot caused the setup to be hurried and the shooting to start before the hunters were ready. Always give yourself extra time to account for any unforeseen delays. Even though A1 and A2 were experienced duck hunters, they made the cardinal sin of gun safety. They put loaded guns (safety off) on the ground and then walked in front of the muzzles to place the decoys. Never load a gun before you're ready to shoot. Never leave a loaded gun out of your control. Always keep the safety on until it's time to shoot. And never walk in front of the muzzle of any gun. The safest way to think is that all guns are loaded and ready to fire. The dogs taken off the leash was just the last link in a chain of events destined to create this mishap. A tragic accident happened because the Airmen were in a hurry, and risk management was forgotten.

THE Air Force Safety Center
PROUDLY CONGRATULATES:

National Safety Council Award

Staff Sgt. Natalie Turner, 100th Air Refueling Wing, RAF Mildenhall, England, has been recognized by the National Safety Council as a "Rising Star of Safety." She was one of "40 under 40" safety professionals recently distinguished for improving workplace safety.

Staff Sgt. Turner exemplifies the definition of a "Rising Star" by demonstrating safety leadership in a multitude of ways. She led the development of an advanced driver's training program for all newcomers to her base directly contributing to a 30 percent decrease in traffic mishaps over the past two years. Staff Sgt. Turner revamped the base lock-out tag-out (LOTO) program in an effort to mirror U.K. and U.S. requirements resulting in the elimination of 27 headquarters LOTO findings. She redesigned the base safety inspection program systematically auditing the master facility list and implementing a plan to drive 100 percent compliance. Staff Sgt. Turner taught 247 supervisors in supervisors' safety classes, 35 unit safety representatives and 1255 new drivers about the local hazards of driving in the United Kingdom. She facilitates a culture of safety during her unit commander in-briefs and leaves them with a plan of action to reduce mishaps, reinvigorate their safety programs and instill a mindset of balanced risk management.

She has also fought for funding to attend advanced safety classes in an effort to continually improve the Air Force's safety record.

Staff Sgt. Turner was selected as a "Rising Star of Safety" from a field of more than 200 nominees.

U.S. Air Force photo

Slip Sliding Away

Photo by Trevor Lush

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When winter arrives, you should:
a. Wear shoes appropriate for the weather.
b. Be on the lookout for black ice, whether driving or walking.
c. Get a clue.
d. All the above, but especially c.

One of the oldest jokes in the world involves a hapless soul who slips on a banana peel. It makes me smile just thinking of it. What doesn't make me smile is the idea of arms and legs flailing as folks slip on icy sidewalks, going up, going down, bouncing a few times and then heading to the doctor. Anyway, it's winter. That means ice, snow, slips and falls, so you need to be careful.

It's also important to pay attention to your shoes. Take someone who was wearing 4-inch heels — in slippery conditions. She stepped outside, performed a full glide with an attempt at a double axel, then fell and ended up with a fractured foot. Ooh la la, those shoes were cute — but the orthopedic boot? Not so much.

Sometimes the fall is just not so graceful. For instance, one Airman was leaving base lodging to walk to work. Only a few feet outside the doorway, he slipped on some black ice. For those who don't know about black ice, it takes the color of the material it settles on. He did a split (OUCH!) and came to rest on his left side. The sudden movement and weight exchange to the right ankle caused a fracture.

And, of course, there's always the guy who just doesn't get it. He went to the shoppette, bought something in a glass bottle to drink (wonder what that was?) and headed back to the dormitory. As you might expect from the theme of this article, he slipped on some ice. The bottle broke and a shard of glass penetrated his forearm, lacerating a tendon and requiring surgery. Poor guy. Why don't I feel sorry for him? Because he reported that he "hadn't even considered the possibility of ice on the sidewalks," even though it was evening and temperatures were in the freezing zone. He never once thought about the snow; he was just walking to the shoppette and back. We know what to get him for his next birthday — the game "Clue" since his actions indicate he doesn't seem to have one.

Be safe and observant. By the way, the correct answer to the question is "d."

Remember, Air Force safety is NO accident!

Greetings from the New Chief of Aviation Safety

COL. ERIC KIVI
Chief, Aviation Safety Division
Air Force Safety Center
Kirtland AFB, N.M.

U.S. Air Force photo

Greetings, folks! This is my first safety position, and I'm coming to the Air Force Safety Center from the flight line. My background is in special operations and rescue, and I've commanded units at the squadron, group and wing levels. Because of my recent operational experience, I know the stressors on our aircrews and maintainers and am familiar with the challenges of flying our current fleet of aircraft. My last wing had a mix of specialized aircraft from Vietnam-era C-130s and UH-1s to the revolutionary CV-22s. In our Air Force, each weapons system presents its own unique operational and safety challenges for its maintenance and aircrews.

The Air Force continues to fly aging aircraft, while at the same time bringing in new aircraft and adapting to new and more complex missions. During this period, we've had great success in reducing aviation mishaps. The Air Force enjoyed its lowest aviation mishap rate in 2009. In 2010 we're proving last year wasn't a fluke as our success continues.

The Aviation Safety Division continues to strive to make improvements in safety, and we're happy to take some credit for the Air Force's success. Many of the actions we've taken in Air Force safety have paid dividends, and the Aviation Safety Division will continue to support your safety initiatives at the Air Force level.

But let's be clear — everyone involved in Air Force aviation deserves credit. Almost a decade ago, the Secretary of Defense directed us to reduce our mishap rates. We're meeting that challenge because of the performance of leadership at all levels — major commands and wings, all the way down to flight commanders, production supervisors, the Airmen who maintain the aircraft and the crews who fly them. Our diligence is paying off, and our mishap rates have plummeted. I can't tell you which aircraft we've saved or how many crewmembers are still living who might have already perished in mishaps. The reality is that you and your fellow Airmen are doing the mission and saving lives. Safety doesn't hinder operations; safety enables operations. Don't take your eye off the ball — leadership involvement at all levels is the key in safety.

Professional Airmanship

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U.S. Air Force photo by Terry Wasson

Airmanship: Crew resource management guru Tony Kern says, "It's the consistent use of good judgment and well-developed skills to accomplish flight objectives." The mission of the safety investigation board is to figure out what caused a particular mishap and find ways to prevent it from happening again. When human factors are suspect, we analyze the mishap aviator's airmanship. Successful airmanship is more informative than failure. How many times do we stop to analyze the good decisions an aviator makes or even our own good decisions? Consider this: Research from the Massachusetts Institute of Technology indicates people learn more from successes than failures, and there's a biological reason why. Scientists have shown the brain responds to successes at the level of individual brain cells — but the cells showed no responses to failures. When we're successful, brain cells become more fine-tuned to what we're learning. After a failure, there is little or no change in the brain — nor is there any improvement in behavior. In another study, soldiers on a navigation exercise were broken into two groups. The first group conducted a series of periodic reviews focusing only on the mistakes they made. The second group focused on what they could learn from both their successes and failures. The soldiers who discussed successes and failures learned at higher rates than the soldiers who just discussed failures. They also learned faster because they developed "richer mental models" of their experiences than those who only discussed failures.

Perhaps as Air Force aviators we focus on failure because success is the expected result 100 percent of the time. What's your post-mission repertoire? Does the phrase "lessons learned" mean a review of all of your failures, all of your successes or, ideally, both? If you're an instructor, do you encourage students to learn from the constant stream of small setbacks or by asking them to analyze what went right and why? Much like in an investigation, my suggestion is for you to ask yourself why you made a specific decision. Keep asking yourself why until you can't ask anymore.

As a community of aviators, we've been conditioned to only examine and critique our failures. Let's provide our nuggets with some richer mental models by analyzing successes, as well. Fly safe!

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U.S. Air Force photo by Senior Airman Larry E. Reid Jr.

RPA Maintainers and

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You've just spent a night on the line performing a 60-hour inspection on an RQ-1 Predator. The run-up check is done, cowl is buttoned up, forms are signed and you've gone back to your room to get a good night's sleep. The next morning you awake to the news that the plane you worked on last night went down due to an engine failure. You start running over things in your mind. Did I do everything right? Did I follow the tech orders completely? Did I really torque that banjo bolt? Correctly?

Soon you get a call from the safety investigation board (SIB) wanting to interview you. Not a good feeling. What do THEY know that I don't? Do they already know I did something wrong? Are they just fishing? I didn't do anything wrong. Why are they harassing me? Unfortunately, this scenario gets repeated several times a year. Each time there is a mishap, even if it's not thought to be maintenance-related, the SIB is obligated to look at the last maintenance performed on the aircraft. In the Predator world, that's quite frequently. Let's look at some numbers.

The Predator is now flying approximately 16,000 hours each month. The only aircraft flying more hours are the F-16 and C-17. At 16,000 hours per month, maintainers are performing more than 250 of these 60-hour inspections every month. With the typical 20-hour-plus mission, an engine gets a 60-hour inspection every three flights. In 33 percent of all Predator mishaps, regardless of cause, it's likely the aircraft will have just come out of a 60-hour inspection. If you were on the SIB investigating a remotely piloted

U.S. Air Force photo by Master Sgt. Scott T. Sturkol

the SIB Interview

aircraft (RPA) that had an engine malfunction and crashed just after a 60-hour inspection, wouldn't you be interested in finding out everything you could about the last maintenance performed?

What can you expect, and what should you do when you're called by the SIB for an interview?

You can choose to interview with the SIB in one of two ways. It can be a "privileged" or "non-privileged" interview. The main difference is that with a privileged interview, the statements you make can only be used for mishap prevention purposes and may not be used against you for any disciplinary actions. It's also protected from public release. The SIB official conducting the interview should read you a statement outlining all the rules before the interview. Be sure you understand them. If you don't, have the official explain everything. The purpose is to be able to get to the root cause of what happened by frank and open discussions to prevent a mishap from happening again.

The best thing you can do to prepare for an interview is always follow the technical order (T.O.). Then you can sleep well at night and not have to worry about the discussion. Your response to every question can be, truthfully and honestly, "Yes, sir, I did the 60-hour inspection, and I did all per the T.O."

What if you didn't follow the T.O.? It's important to also be honest about that part. That's why you have the opportunity for a privileged interview. Being honest and open may be the difference between a quick solution to the mishap and prevention of future mishaps versus a long, drawn-out, expensive and useless engineering investigation involving thousands of hours of manpower with a report that ends up saying, "For an unknown reason … ."

Trust, but Verify

U.S. Air Force photo by Paul Ridgeway

MAJ. MICHAEL "PIC" CONTE
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Flying remotely piloted aircraft (RPAs) is a team sport. It's not unusual for up to 10 different pilots to fly a single aircraft on a single mission. Though they work separately, the pilots also have to work as a team. Each team member has a responsibility to other pilots, or at least those that follow in the mission. If you're the pilot in hour two, your decisions may affect the pilot flying in hour 16 who's at home sleeping while you're in the seat. Flying RPAs is much like the game "Telephone." Messages can distort after 20 hours. Serious problems can be diminished, or minor issues have the opportunity to be blown out of proportion. Sometimes you're stuck with the aftermath of another pilot's decision-making process. Let's examine a few of the lessons learned from flying Predator and Reaper RPAs.

Sometimes ensuring safety is as simple as taking an extra moment to make sure something is done correctly — trusting the people around you to do the right thing, but at the same time verifying your system is set up correctly in order to maximize your chances for success. Unique to RPAs is that you can assume command with a mission already underway and never talk to the crews who took off or flew the first several hours of the mission. As soon as you're in the seat, it's your aircraft, and you may be left with a set of problems — both known and those yet to be discovered. One example is fuel management. Flying faster than necessary decreases the crew's options at the end of the mission. The crew at the beginning or end of the mission may be you! With longer missions, even a few extra pounds of fuel burned each hour can leave a couple of hours less to navigate around weather, divert or prosecute targets. If you take over at the end of the mission, you may end up hearing, "Oh, by the way, you may have to RTB early."

This brings us to the "Oh, by the ways." These usually occur after you've taken the seat and are digesting the changeover brief. Sometimes they're the things never said but should've been brought to your attention. They're always worth a little extra attention; otherwise, why would they have been mentioned? An "Oh, by the way" could be that small piece of information that can affect the rest of the mission. If you have to leave the control station when it's less than optimal, leave your

replacement in the best situation possible. Provide as much information as you can so good decision-making can continue. Who knows? You may be flying the same line later and will appreciate the good decisions made in your absence.

Not only are there pilots who will control the aircraft before and after you, but there's the team available to help when you're in the seat. That's one of the benefits of flying RPAs — help is only a phone call, chat room or panicked scream away. With regard to help, there's a difference between troubleshooting and compounding your problem. If you don't know what you're doing, get help from someone who does. Additional items to consider for your situation: Is there T.O. guidance? Are you qualified to do what you're thinking about doing?

Another unique aspect of RPAs is the "lost link" logic contingency. This is what the aircraft is programmed to do if it isn't in contact with the ground station. In the case of the Predator and Reaper, the pilot determines the lost link emergency mission that includes airspeed, altitude, waypoints and loiter time. The emergency mission usually terminates in a location where the recovery aircrew can regain link and land the aircraft. Things the crew must consider ahead of time are weather, other aircraft and mission impact. It's definitely a sinking feeling when the aircraft has gone lost link, and you find there was a problem with the emergency mission. Emergency missions are like insurance policies. When you're lost link, it's too late to change it. When the lost link mission is good, you know where the aircraft is going and what it's going to do to steer clear of trouble. Check the emergency mission because loss of link is seldom predictable. Your flight path should be.

Your job doesn't stop after you've handed the aircraft off to another pilot or landed. Like any other aircraft, close the loop by passing thorough write-ups to maintenance so issues don't continue to be someone else's problem. At every step, try to leave the next person with the best possible situation. While some situations may not be ideal, there is a certain amount that can be improved with the right information. Trust those around you to do the right thing, but verify that you are, too.

U.S. Air Force photo by Staff Sgt. James L. Harper Jr.

BASH Risk:

What Will the Oil Spill Mean for the Bird Migration?

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British Petroleum has finally gained control over the massive oil leak emanating from the Deepwater Horizon oil well disaster in the Gulf of Mexico. In addition to fouled beaches, this catastrophe has had significant negative impacts on a number of species of birds and other marine life across the Gulf Coast. When migrant birds arrive this winter, they're sure to find a degraded and possibly still-toxic coastline. In an attempt to protect migrant species and alleviate this situation, the Natural Resources Conservation Service (NRCS) launched the Migratory Bird Habitat Initiative (MBHI) in the fall of 2010.

The primary focus of the initiative is to improve habitat conditions across the five gulf-bordering states from Texas to Florida and extending northward to include Georgia, Arkansas and Missouri. Incentives, via financial assistance, are being offered to farmers and landowners to flood their properties in target areas with a primary focus on lands within the Mississippi Alluvial Valley and the Chenier Plain in Louisiana and Texas. These enhancements commenced in July 2010 and will continue through August 2011 across specified areas based on different species' needs and locations. It's envisioned that these enhancements to private agricultural lands and those already listed under the Wetlands Reserve Program will provide an offset to migrant bird habitats degraded by the oil-spill.

While the habitat enhancement initiative may be a benefit to migratory birds, this resulting shift in bird activity raises the question of whether this action will impact the safety of our low-level training flights. Bird migrations are heavily dependent on weather activity and are often significantly impacted by frontal fluctuations. For example, if northern tier states have a relatively mild onset to winter, migrant birds may take their time moving south or may not travel in large numbers as far as the Gulf Coast. On the other hand, a harsh winter up North might send large populations of migrants into the enhanced and purposely flooded Southern areas. Likewise, if the South undergoes a harshly cold winter, all the enhancement acreages could freeze over, sending the migrants right into the oily coastal marshes, producing less than desired results. Although a noble effort to protect wintering birds, the outcome of the MBHI will be very difficult to predict at this time and is no cause for changing planned low-level flight activity.

What if all goes as the NRCS plans and the Gulf Coast begins to harbor significantly larger wintering

Background: U.S. Air Force photo by Tech. Sgt. Adrian Cadiz
Foreground: Jupiterimages
Photo Illustration by Dan Harman

populations of birds where we normally fly low-level? As they say in the current smart phone commercials, "We have an app for that." The Air Force's "app" is called the Avian Hazard Advisory System (AHAS). The earliest component of this system was called the Bird Avoidance Model (BAM). When the BAM was first developed, we assembled a large 30-year data set of information on bird migrations. We linked bird flight activity information with the bird's desired geographical habitat along their flyways, bird aircraft strike information from the Air Force's bird strike database and low-level flight maps. Although somewhat crude, it was the best available information and the first time such information was displayed using a geographic information system software platform.

Although very useful, it didn't take long for the pilot community to recognize that the historical model too frequently predicted low-level routes as bird condition "severe." While flyway corridors don't change from year to year, the onset and vigor of migrations does change dramatically based on weather as previously described. In other words, if significant numbers of birds were recorded in the area at any point during the 30 years covered in the data set, the BAM would predict heightened flight risk regardless if birds were actually in the area. The issue of displaying historical data drove the development of the current AHAS where weather radar was added to the system. With the incorporation of the nationwide distribution of next-generation radars, or NEXRAD, we were able to "view" areas of historically predicted bird activity and ascertain in near real-time whether birds were in fact present. This enhanced ability enabled fliers to access areas previously restricted as bird condition "severe" if no bird activity was being detected via radar.

Yes, there may be some changes in migratory bird activity this winter due to the oil spill and subsequent habitat enhancement, but wild populations are always subject to change without prior notification. This is precisely why the Air Force developed and continues to develop the use of radar systems to detect and deconflict birds and aircraft. The proposed MBHI may be a good reason to visit or revisit the tutorials posted on the AHAS website, located at www.usahas.com. Understanding and use of this flight safety tool may be all that's needed to make relatively minor adjustments to low-level training flights and keep bird strikes to a minimum in the face of an ever-changing risk profile.

Ground De-icing and Anti-Icing of Aircraft

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It's early August. Outside, it's 82 degrees; winds are calm; skies are a beautiful blue with a few cirrus clouds. So why am I thinking about de-icing and anti-icing aircraft? Weather conditions will change soon enough. One morning you'll head out for that morning sortie and there'll be frost on the wing. Not a big deal, right? If handled incorrectly, it could be!

In terms of weather, this year will be like many others. Summer will give way to fall and winter, conditions will gradually worsen and winter storms are bound to periodically roll down the flight line, no matter where you're stationed. Are you prepared for the inclement winter weather you'll inevitably encounter? Are you familiar with the ground de-icing and anti-icing procedures for the aircraft you operate?

Icing presents a long list of hazards for aviation. First and foremost, know that there's no "safe" amount of frost, ice, snow or slush to have on an aircraft at takeoff. That little bit of frost on the wing presents substantial performance penalties in terms of reduced lift, increased drag, increased stall speeds, increased takeoff distances and decreased rates of climb. Other icing hazards include the refreezing of melted precipitation, potentially inhibiting full travel of flight control surfaces, disturbed and asymmetrical airflow resulting in abnormal pitch and roll characteristics, erroneous instrument indications and the potential for foreign object damage, or FOD. These hazards have killed before, and they can kill you. Given the list of hazards and their potential severity, it's no wonder the Federal Aviation Administration (FAA) has a "Clean Aircraft Concept" (Federal Aviation Regulation 121.629). Through this guidance, the FAA prohibits takeoffs when frozen precipitation is adhering to the wings, control surfaces, propellers, engine inlets or other critical surfaces of the aircraft. This concept is reiterated and established as U.S. Air Force policy in Air Force Instruction 11-202, Vol 3, *General Flight Rules*, paragraph 5.27, which states, "The pilot in command will not take off with ice, snow or frost adhering to the wings, control surfaces, propellers, engine inlets or other critical surfaces of the aircraft, unless authorized by the aircraft single manager or flight manual."

Aviation mishap history and research into the effects of icing affirm the logic and necessity for the Clean Aircraft Concept and U.S. Air Force policy to assure safe

winter operations. The simple fact is that performance tables in your flight manual are based upon clean, uncontaminated surfaces. There are no allowances for frozen precipitation!

Frozen precipitation is dealt with through the execution of de-icing and anti-icing procedures. The difference between the two is that de-icing is the removal of frozen precipitation from an aircraft while anti-icing is the prevention of its accumulation.

De-icing procedures may involve physically sweeping, brushing, blowing or wiping away the frozen precipitation. Applying heated de-icing fluids is also very common. These fluids have been specifically formulated, tested and approved for the purpose of de-icing aircraft. Although marketed under various brand names, they all must meet the requirements for the specifications they are certified to meet.

Anti-icing is accomplished through the application of anti-icing fluids. Like de-icing fluids, they are formulated, tested and approved, but to a different set of requirements. The primary advantage of these fluids is their ability to prevent the accumulation of frozen precipitation on a clean aircraft surface for a limited amount of time, known as the "holdover time." The time varies based upon several factors, such as high winds, jet blast, heavy precipitation, wet snow, outside air temperature, aircraft skin temperature when lower than the outside air temperature, direct sunlight and specific fluid used.

Because of these variables, changes in product offerings from manufacturers of de-icing and anti-icing fluids and the fact that we continually learn more about icing hazards, the Air Force Flight Standards Agency (AFFSA) annually publishes *"Holdover Time Tables."* This publication presents up-to-date information for safe operations in the presence of frozen precipitation. This essential publication can be found at the AFFSA Flight Directives Division website (https://afkm.wpafb.af.mil/a3of) and must be used in conjunction with Technical Order 42C-1-2, *Anti-Icing, De-icing, and Defrosting of Parked Aircraft*, and the tech orders specific to the weapons system you operate.

So what can you do? Start preparing before the first frost arrives. It's been a beautiful summer, but it's time to review ground de-icing and anti-icing procedures. Read, understand and follow the required procedures. Be aware of the weather, understand its impact and be alert for changes. Know your aircraft and its unique issues. Know what the ground crews are doing — when they start de-icing/anti-icing, what fluids they're using, if they're using enough, if they're being diluted and what areas are being covered. After de-icing/anti-icing, if you experience a delay and find yourself wondering if you've exceeded a holdover time, go back and de-ice/anti-ice again! There's plenty of data to show that the Clean Aircraft Concept is essential for a safe takeoff.

DOD photo by Senior Airman Jonathan Snyder

Cold Weather Flying

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Canadian Forces Base Cold Lake, Alberta, Canada, is a winter wonderland in December. One year, the area had received a large amount of snow early in the winter season, and a few winter storms had already hit the base. The holidays were just a few days away, and I was going to celebrate them with my wife and our 9-month-old daughter.

The week before the holidays, our squadron flew regular air-ground missions. Part of the training involved heading to the Jimmy Lake Weapons Range in Alberta for practice weapons delivery. I was No. 3 in a four-ship of CF-5s. We would be flying the first wave to Jimmy Lake, delivering modular practice bombs and CRV-7 rockets and honing our gun-strafing skills. The weather turned out to be perfect that day — clear skies, very light winds and the temperature was 5 below zero. Overnight temperatures were forecast to be minus 12. With these conditions, we were dressed in full winter gear.

All flight planning and preparations were completed, and no alternate was needed; if required, it would have been Edmonton, Alberta. Edmonton is just over 100 nautical miles to the west-southwest and would have required considerable fuel reserves.

Our four-ship was the first to launch that morning; taking off after us would be CF-18s and the venerable T-33s. On the surface this appeared to be a routine training mission flown by experienced pilots — all had completed at least one tour on the CF-18.

The sortie went as planned; the range work, procedures and radio calls were all completed to perfection. All that

Canadian Air Force photo

remained was to return to base (RTB) via the overhead break and, if gas permitted, a closed pattern or two. This was turning out to be one of those rare, near-perfect missions from start to finish.

On RTB we discovered all was not well at the airfield. As we tried to check in with the air traffic control (ATC) tower, we heard two CF-18s had diverted to Edmonton. The radio was extremely busy and there was much confusion. I distinctly remember hearing, "The airfield is blanketed by ice fog caused by departing CF-18s; all aircraft expect to divert to Edmonton." Conditions favorable for ice fog formation are air temperature below zero, a small temperature dew point spread (less than 2 degrees) and high humidity.

Immediately our four-ship climbed to 20,000 feet and slowed to max endurance. We switched to the instrument flight rules (IFR) recovery frequency. Again, the radio was busy with aircraft trying to recover to the base. We couldn't get a response from ATC since they were overwhelmed with IFR traffic. We knew our situation was bad, but not yet dire. We couldn't divert to Edmonton — Cold Lake was our only option. To make matters worse, the CF-5 had no instrument landing system (ILS) capability; we were PAR (precision approach radar) only for precision approaches at a Category E speed.

We held at max endurance and continued calling out to ATC. After what seemed like an inordinate amount of time, ATC directed their attention to us. At this point we had enough gas for only one approach, and our section was split into elements. On the radio we continued to hear that aircraft were diverting to Edmonton. The situation was now dire.

I knew from experience that PAR recoveries never put the CF-5 in a good position to land from decision height (DH). We usually ended up off-centerline or slightly high. The PAR controllers tried their best but, in the last two miles of the approach, the speed of the CF-5 caused the PAR controllers to fall behind on their corrections. I knew I had to fly a perfect PAR approach with careful attention paid to glide path calls. I couldn't do anything to correct for centerline errors other than follow the controllers' instructions.

As I led the second element, I had the benefit of hearing how the first element was being controlled. Unfortunately, and as expected, in the last two miles of their approach, I could sense the PAR controller was struggling. When the controller asked for our missed approach request, I heard a distinct change in the controller's voice when we requested ejection vectors as our missed approach.

Canadian Forces Base Cold Lake has two parallel runways. The inner runway is the longer of the two and is the dedicated IFR runway while the outer is for visual flight rules traffic. The lead element was approaching DH for the approach. As I listened carefully, I heard lead call "Visual between the runways; two take spacing." No. 2 very wisely not only took spacing, but immediately moved over to land on the outer runway as this was the closest runway to him and, due to IFR conditions, he knew the runway wasn't being used. This was an excellent decision as it allowed each pilot to land and use drag chutes to decelerate if necessary.

I expected the same situation would repeat itself for my element. We ended up at a similar DH between the runways. Like the element in front of us, I took the inner runway and my wingman landed on the outer runway — a successful ending to our mission.

I was reminded of a few valuable lessons on that cold, December day:

1. Everyone in aviation must work together; if something changes, like the weather, notify all concerned.
2. Our formation should have requested priority from ATC.
3. Cold weather flying requires proper preparations — respect the elements!

U.S. Air Force photo by Senior Airman Christopher Hubent

U.S. Air Force photo

Proactive Safety in

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She was used to finding all sorts of odd things during foreign object damage (FOD) walks, but nothing could've prepared her for the mysterious object she stumbled upon that particular day. There she was, brand new to her deployed location, staring down at what looked to be a rusty-old oil lamp at the edge of the taxiway. She used her uniform sleeve to wipe off some of the dust from the lamp when suddenly a genie appeared! The genie let out a loud sigh of relief, and a huge smile appeared on his face. He turned around, thanked her for liberating him and started to fly away.

"Not so fast!" she yelled. "Isn't it standard operating procedure for liberated genies to grant wishes to whoever sets them free?" The genie's flight came to an abrupt halt; he slowly turned around in midair. His smile turned into a grimace, and he forced himself to utter, "Fine. Go ahead and state your wishes, but make it snappy because I'm in a rush!"

She thought of her responsibility to protect her fellow Airmen, pondered her opportunity and then asked, "I want to know about the next aviation mishap my wing will have. How will it happen?"

The genie shook his head in disgust and said, "Where have you been living? You don't need me for that. Haven't you heard of Military Flight Operations Quality Assurance (MFOQA) and the Aviation Safety Action Program (ASAP)? Stop wasting my time!" He then turned and flew away.

What is it that keeps commanders and safety officers awake at night? They toss and turn in bed with the same haunting thoughts running through their heads: What do I NOT know that I SHOULD know? Where are my operational blind spots? How close are we to having a major mishap? Will it be tomorrow, next month or next year?

Flight safety in the 21st century has a new approach to answering those questions. We call it evidence-based proactive safety. "Evidence" means we use either quantitative or qualitative data, sometimes both, to determine our blind spots. "Proactive" means we intervene to break an accident chain BEFORE we get a "smoking hole."

We know that mishaps result from a combination of errors that end up hurting people or bending metal. NASA studies have demonstrated that over 200 errors can be

by Senior Airman Kasey Zickmund

U.S. Air Force photo by Capt. Marnee A.C. Losurdo

the 21st Century

identified before a serious incident or accident. Why not develop a way to detect those mishap links before they produce pain? That's precisely what evidence-based proactive safety does. We use MFOQA data to determine how close and how often we operate to safety margins, and we use ASAP reports to find out WHY we are making the errors that erode our safety margins.

Evidence-based proactive safety means getting dramatic insights into what's happening "in the system" before we read about it in a safety investigation board report. It means actively looking for snakes in the grass that are ready to strike without warning. With MFOQA and ASAP, we DO know what we DIDN'T know.

Could that be why over 100 airlines use evidence-based proactive safety as a fundamental process? Atlantic Southeast Airlines hopes to have their entire fleet churning out Flight Operations Quality Assurance (FOQA) data by this winter, and Delta Airlines expects to receive 10,000 ASAP reports in 2010.

Surely we can do as much, if not more, as our sky-sharing brethren from the commercial sector. It may be more comfortable for us to cover our eyes and ears, curl up into a fetal ball and repeat the mantra of trailing-edge safety: What I don't know can't hurt me!

But that would mean living in the dark ages of flight safety. What are the top excuses we hear for not moving safety into the 21st century?

1. That doesn't apply to us — those programs are for heavies.

2. Those programs are for pilots — not for loadmasters or maintainers.

3. Don't be stupid, dude — keep it quiet or they'll shoot you in the head.

Guess what? All of those excuses are invalid! Evidence-based proactive safety applies to ALL aircrew and maintainers and has already saved Air Force lives and aircraft. Yes, that means YOU, the F-22 driver — and YOU, the remotely piloted aircraft maintainer. We're moving the Air Force into a "just culture" model that respects and encourages aggressively searching for and detecting mishap links. Everyone looking out for everyone; or, as we like to say, "Every Airman a sensor."

Do your part to move Air Force safety into the 21st century. If your aircrew or maintainers don't participate in MFOQA and ASAP, petition your leadership to join the fight. Ask your leadership to look into them; otherwise, you're on the sidelines.

Welcome to the cutting edge of flight safety.

Three Words

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

LT. COL. BILL NEITZKE
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Safety, compliance and enforcement — it's rare to hear these three words together, especially from an aviation safety professional. While compliance and enforcement are an integral part of weapons and ground safety programs, the aviation safety professionals often see compliance and enforcement as someone else's responsibility. How many times have you heard the guy in the flight suit say safety is a "white hat" program? We leave the compliance and enforcement part to the "black hat" guys in Stan/Eval.

It might be helpful to take the approach that safety, compliance and enforcement go hand in hand. Take a look at the evaluation standards for your aircraft. Evaluators are charged with ensuring flight safety. They're directed to intervene immediately and take corrective action for any flight safety violations. Usually, these are "pass/fail" items for check rides. If you look at how maintenance quality assurance evaluations are conducted, you'll see similar practices.

Here's an example about enforcement I often use during safety meetings. As the safety officer, I can tell you all day long how a particular stretch of highway is dangerous and that you should slow down. I can explain the blind curve, how the road is slippery (especially when it rains) and how wildlife is often in the road. Despite all these warnings, people will continue to exceed the speed limit on the road. If, however, I tell you that you should slow down because the local patrolman sits just around the blind curve and issues tickets, most drivers will slow down.

How does this play out in the aviation safety world? First, don't be afraid to be visible. Everyone notices the safety truck with the lights on top and big sign. Just having it around makes people a little more aware of their safety practices. Second, don't limit the times you're out and about to just the day shift. Work happens around the clock, and it's always good for the safety professionals to see what's happening on swing or midnight shifts. Finally, don't hesitate to make spot corrections when you see a safety violation.

Safety really does wear a white hat, especially in the aviation community. However, as I recently heard from a very experienced safety officer, "The white hat of safety should always have a black rim around it." Safety practices are established for a reason. Make sure part of your program is to ensure compliance with these practices, using the tool of enforcement if needed.

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.

Capt. Nicholas M. Dipoma
Capt. Marc K. Milligan
6th Special Operations Squadron,
Hurlburt Field, Fla.

The Aviation Well Done Award is presented to Capt. Nicholas M. Dipoma and Capt. Marc K. Milligan, 6th Special Operations Squadron, Hurlburt Field, Fla., in recognition of exceptional performance during an emergency while on a routine training mission. On Oct. 15, 2009, Capt. Dipoma and Capt. Milligan flew a UH-1H Huey on a routine training sortie at Hurlburt Field. While performing a simulated loss of hydraulics emergency procedure, the aircraft experienced a hydraulic hardover, one of the deadliest helicopter emergencies, requiring immediate action to preclude a crash. The hardover threw the cyclic full forward and left, forcing the nose down 30 degrees and causing the aircraft to bank so severely that it approached 90 degrees before the roll could be arrested. The crew immediately applied correct and timely BOLDFACE procedures to regain control and safely land the aircraft. Their superb airmanship, hands-on flying skills and crew coordination prevented a catastrophic mishap. Their extraordinary actions ensured the survival of their crew and prevented the loss of their aircraft. The outstanding leadership, airmanship and safety awareness displayed by Capt. Dipoma and Capt. Milligan reflect great credit upon themselves, Air Force Special Operations Command and the United States Air Force.

Maj. James Morimoto
Capt. Wesley Sides
Mr. Victor Arzuaga
374th Airlift Wing
Yokota Air Base, Japan

The Aviation Well Done Award is presented to Maj. James Morimoto, Capt. Wesley Sides and Mr. Victor Arzuaga, 374th Airlift Wing, Yokota Air Base, Japan. These individuals distinguished themselves by superior performance in hosting the first-ever U.S./Japan Midair Collision Avoidance Conference on Jan. 10, 2010. More than 140 Japanese civilian, government, military pilots and controllers attended, discussing flight operations and airspace issues throughout the Kanto Plain. To familiarize attendees with U.S. Air Force operations, static displays of Yokota-based aircraft were also provided, along with a tour of tower and radar approach control. Questions and issues raised by Japanese attendees were later disseminated to the 374th Airlift Wing aircrews during a quarterly flight safety meeting to help increase their situational awareness within Japan. The event provided an increased mutual understanding between U.S. and Japanese aviation communities in hopes of preventing future midair conflicts. Their exemplary efforts, ambassadorship and teamwork serve as an excellent example for all. The outstanding leadership and safety awareness displayed by Maj. Morimoto, Capt. Sides and Mr. Arzuaga reflect great credit upon themselves, Pacific Air Forces Command and the United States Air Force.

Mind over *Motion*

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Have you ever been so involved in a task that you couldn't see the walls closing in around you? Looking back, you probably wish you would've been the person watching from the outside instead of the person who was knee-deep in it. All too often the human mind tricks us into believing the unbelievable. Bystanders can instantly see the hazard but are too far from the scene of the crime to stop the motion.

While I've never been a victim of motion, nor have I caused anyone to be the recipient of my missed focus, I've stood on both sides of this wall a few times in my career. Fortunately, I surrounded myself with helpful members who assisted me when I happened to be on the wrong side. Causes and effects vary in each scenario, but in most cases, it's a distracted mind that causes the mistake. From the moment you wake up in the morning, you may have a bit of unattended business on your mind. That minor distraction may be what prevents you from seeing the correct path to your normal daily success. More importantly, it may be what prevents your team from coming to work and going home safely.

That may have been the case on the day my team was asked to raise and load a 4,000-pound missile at a 45-degree angle. It was a little intimidating at first, but we had done this a few times before.

Simple task, right? Guess again. It's called "complacency." I was fortunate enough to learn the meaning of that word from a very wise team chief early in my career. Complacency is a feeling of contentment or self-satisfaction, especially when coupled with an unawareness of danger, trouble or controversy. It's complacency that'll land someone in the emergency room or, worse yet, a funeral home. If complacency had its way that day, my team would've proceeded with the missile load without question or hesitation. Luckily, we worked together as a team, and everyone's head was in the game. So what was the problem? It wasn't anything that my team did or didn't do, but rather what someone else failed to do correctly.

Assembling the aft attachment block on an AGM-129 missile to mate it with a MHU-200 handling unit is a straightforward operation. There are four easy steps: (1) Position the missile over the handling unit, (2) Torque the correct adapter onto the missile, (3) Thread the draw bolt into the adapter and (4) Torque the locknut. It seems simple enough, but on that day, it wasn't. An alert team member whose mind was in the game noticed something was wrong. He could've just continued with the operation and kept his mouth shut; lucky for us, he didn't. He asked a simple question that stopped the entire show: "What's up with this?" The previous team that had handled the missile was tasked with installing it on the handling unit. Unfortunately, they installed the wrong handling unit adapter. This cocktail of mix-matched components spelled death for the team that would load the missile the next day. Yes, that would be my team.

In the hustle to get all the missiles loaded, the Airman could've silently overlooked the problem, but he knew something looked wrong and questioned it. What caught his attention was 3 inches of thread visible on the draw bolt. That's not normal. Hanging 4,000 pounds at a 45-degree angle by three threads probably wouldn't be good. I'm convinced that this Airman's attention to detail saved someone's life that day.

Fortunately, the daily motion of getting the job done didn't prevail, and I, for one, was very happy. We all went home just minutes after that incident. Mind had beat motion that day.

U.S. Air Force photo by Airman 1st Class Kendra Fulton

Explosives Notifications

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As all weapons safety managers (WSMs) and explosives facility custodians should know, explosives hazard class divisions (HCDs) must be updated at the Fire Alarm Communication Center (FACC) as soon as explosives are introduced or removed. However, sometimes these updates are not made. What consequences would occur if the FACC didn't know what HCD is located at each explosive facility?

While driving around the munitions storage area one afternoon, I noticed a conventional munitions loading operation being conducted. I decided to stop and conduct a spot inspection because there appeared to be a large number of munitions at the location.

As I entered the area, I was given a safety briefing and shown that all safety items were serviceable and available. I stayed and observed as munitions were delivered and transferred. At the end of my spot inspection, I counted the number of munitions at this operating location. After doing the inventory, I outbriefed the team — notifying them that they were running their operation like a well-oiled machine. I soon found out that things were not as well-oiled as they appeared.

U.S. Air Force photo by Senior Airman Timothy Taylor

I left the operating location and arrived at Munitions Control to add the total net explosive weight (NEW). I called over the munitions controller so he could tell me the numbers that he showed at that operating location. The answer took me by surprise. The number he gave me was approximately 30,000 pounds of NEW lower than what I had just physically inventoried!

As it turned out, a tenant unit had dropped off approximately 30,000 pounds NEW of munitions at the same operating location earlier that morning. The tenant unit hadn't reported the NEW increase to the host Munitions Control. I then decided to verify the HCD with the FACC. The HCD was incorrect and was showing no HCD present.

Since the sited NEW limitations were not exceeded, I was asked, "What's the problem if we didn't bust our sited NEW limits?" They in fact were in violation with Air Force Manual 91-201, *Explosive Safety Standards*, paragraph 10.4.7, which states, "Notify the Fire Alarm Communication Center each time fire-fighting symbols are changed."

This non-communication with the FACC could have resulted in jeopardizing the lives of emergency responders in the event of an incident, accident or fire at this location.

These rules also apply to licensed locations. I was driving my vehicle to get lunch and noticed that a licensed facility didn't have a fire symbol posted. On my way back from lunch, this same licensed facility had posted their fire symbols. After seeing this, I decided to stop and perform a spot inspection.

I verified their inventory sheet and asked a supervisor if the HCD had been called in to the FACC. I was told that he didn't know because he didn't post the fire symbols.

After hearing this response, I decided to stop by the FACC to verify that the HCD updates were called in. Just as I suspected, they weren't. I documented this incident with a spot inspection recommendation. I recommended that the operational supervisor additionally notify the FACC when the fire symbol is changed. The unit then implemented this recommendation by establishing a policy letter that's posted at the licensed location. It's now part of their pre-task crew briefing.

In another incident involving a licensed location, the location had 1.3 HCD explosives posted on their building and in their inventory. However, they were authorized for 1.2 (a higher HCD), and the FACC also showed 1.2. This non-notification was due to the inexperience at the licensed location and at the FACC. Each unit was under the impression that the HCD would always be 1.2 because the HCD had never changed for this location. Even though the area is licensed to hold 1.2, the FACC was treating this location as if 1.2 munitions were present. In this instance, the highest HCD present was 1.3. Fire-fighting techniques are different for 1.2 and 1.3 explosives. If a fire was to occur at this location, the fire responders may have taken more precautions than necessary to fight the fire. The extra time involved in taking the extra precautions could have been enough time to prevent unnecessary losses to equipment, facilities or lives.

As WSMs, we need to emphasize to our additional duty weapons safety managers (ADWSMs) and licensed location users the importance of updating HCD at all

sited and licensed locations. The most effective way of instilling this information is through the initial training of ADWSMs and continuous spot inspections from both WSMs and ADWSMs. It's vital that detailed pre-task briefings are conducted whenever there are personnel exposed to any explosives. Additionally, it is paramount that all fire symbols posted are correct and current with the FACC. This ensures all users and emergency responders are aware of the current hazards present at all locations at all times.

UXO Safety and You

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DOD-Wide Unexploded Ordnance (UXO) Investigation

The Defense Environmental Restoration Program established the Military Munitions Response Program (MMRP) in September 2001. This program identifies and responds to environmental and explosives safety hazards posed by munitions and explosives of concern (MEC) and munitions constituents (MCs) at closed, transferred or transferring ranges (not active ranges). Since the MMRP investigation began, Air Force Space Command (AFSPC) identified three installations containing MEC and UXO: Vandenberg AFB, Calif.; New Boston Air Station, N.H.; and Buckley AFB, Colo. While Patrick AFB, Fla., Clear Air Force Station, Alaska, and Cape Canaveral Air Station, Fla., have closed their small arms ranges, they don't require clean-up under MMRP and have been determined to require no further action. Let's discuss weapons safety manager (WSM) responsibilities pertaining to the management of UXO areas on an Air Force installation.

WSM UXO Management

When UXO or MEC is discovered on an Air Force installation, the WSM must become involved in managing the response site. Department of Defense 6055.09-STD, *DOD Ammunition and Explosives Safety Standards*, Chapter 12, establishes procedures to protect personnel from hazards associated with MEC and chemical warfare agents. While the likelihood of encountering UXO on an installation may be considered low, UXO is encountered routinely throughout the world.

The website www.uxoinfo.com contains listings of articles discussing recent UXO and chemical warfare munitions discoveries. Much of the UXO discovered today in areas outside of the area of responsibility tend to be World War I- or World War II-era explosives or chemical warfare agents that are unstable due to their age.

According to a recent article at the website, an Australian family purchased an older five-bedroom home and came across an old munitions item in the garage under a workbench. Initially, the family considered reporting the find to police, but reportedly didn't do so right away due to concerns that the report might cause an evacuation/interruption of a nearby elementary school. The family finally called police 10 days later when the school was on break. During that time, the family reportedly posed for several photos with the munition, and the father even tried to clean the rust off of it with a wire brush. When the police responded, they evacuated a dozen homes in the surrounding neighborhood. The bomb disposal technicians identified the round as a World War I-era live mortar shell. The bomb disposal unit safely removed the item from the home and properly disposed of the hazard.

There have been instances of children on Air Force installations finding UXO, picking them up and bringing them home. There was also an instance of an individual attempting to enter an Air Force installation with World War II-era bombs in the trunk of his privately owned vehicle.

UXO Safety

These are obvious examples of what NOT to do when you discover UXO. Don't touch, handle or disturb UXO or any type of munitions debris. Contact Security Forces, the installation Command Post or, as a last resort, Explosive Ordinance Disposal (EOD) immediately upon encountering UXO. If possible, place a piece of brightly colored cloth or other easily identifiable item no closer than 10 feet to the UXO to flag it. Don't hammer a stake in the ground near UXO; there may be other hazardous items buried below the surface. If you're in doubt about the situation, simply consult the procedures in your Air Force Pamphlet 10-100, *Airman's Manual*.

If an area on an Air Force installation has been identified as having potential UXO or known UXO, requirements outlined in DOD 6055.09-STD, Chapter 12, must be followed. The item must be identified and the area cordoned off to unauthorized personnel. This can be done with the use of signs or fencing. If signs are used, they should be written in the predominant languages of the region or displayed as pictograms.

Remediation of Areas Known or Suspected to Contain UXO

UXO areas, also called munitions response areas (MRAs), should be digitally mapped and historical records of the areas maintained by the WSM. When practical, MRAs should be remediated to remove the UXO or MEC and return the area to a functional state. This remediation process is identified in DOD 6055.09-STD. In summary, this consists of an environmental clearance contractor submitting an explosive safety submission (ESS) detailing the clearance process for the WSM to review. Once approved, the WSM submits the ESS to the major command Weapons Safety Division who reviews and forwards the report to the Air Force Safety Center (AFSC) Weapons Safety Division and the DOD Explosives Safety Board (DDESB) for their approval. Once an MRA is cleared to a level described in the ESS, an after-action report accompanied by a certificate of clearance is submitted to the DDESB. If the clearance actions suffice to return the land to its desired end use, the DDESB approves the after-action report and maintains a copy of the certificate of clearance.

The contractor may also conclude an MRA has no identifiable UXO or MEC and determine no fur-

U.S. Navy photo by Petty Officer 2nd Class Matthew D. Leistikow

ther action is required. The contractor then submits a no-DOD-action-indicated (NDAI) or no-further-action (NOFA) ESS identifying the site and justifying the decision. Some MRAs are not possible to remediate due to dense vegetation or rough terrain. The contractor may recommend institutional controls, such as fencing and sign placement, to keep unauthorized personnel out of the area with no further UXO clearance undertaken. This information is also submitted to the DDESB in an after-action report.

Mission-Essential Operations Inside an MRA

DOD 6055.09-STD summarizes escort and EOD support requirements in areas where mission-essential activities will take place inside an MRA. The responsible commander can determine the level of construction support required, Air Force or contract EOD, when mission-essential activities are necessary inside an MRA. When it's necessary to enter an MRA for mission-essential purposes, anomaly avoidance techniques must be used. These consist of avoiding surface or subsurface MEC and utilizing EOD escort while in the MRA. Explosives safety requires that discovered surface MEC be avoided, and the location noted and reported to appropriate authorities. Detected subsurface anomalies must not be investigated, but they shall be marked, when appropriate, and avoided.

The safety requirements outlined in DOD 6055.09-STD are the minimum guidelines set forth to protect unauthorized personnel from entering MRAs and to protect Air Force personnel while performing their duties inside MRAs. Utilizing land-use controls, such as fencing, placement of signs and public notifications, are necessary to keep the public and unauthorized personnel out of MRAs. Anomaly avoidance, UXO training, identification and escort requirements outlined in DOD 6055.09-STD are provided to ensure risk to Air Force personnel is minimal while performing duties inside MRAs. Following these requirements is essential on installations with areas known or suspected to contain UXO or MEC.

U.S. Air Force photo by Staff Sgt. James L. Harper Jr.

U.S. Air Force photo

Generation M: "It's Just a Pain Killer"

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These days, the doctor can prescribe little pills to easily take away your pain. A dependency on these pain killers can occur, especially if they're misused in any way.

In my last "Generation M" article in the Fall 2010 issue of Wingman, I related my own personal experience of a car accident I was recently involved in. I suffered numerous injuries, but my ankle suffered the most. It was fractured in four locations and dislocated in two. Barely escaping surgery, the bones stayed in place and healed much faster than the orthopedic doctors had originally speculated.

My week-long stay at the hospital came to an end, and the doctor wrote me prescriptions for Oxycodone and Percocet, two of the strongest and most addictive pain killers on the market. I wasn't told of their highly addictive properties; I was just told to sign an affidavit. These drugs are part of a growing epidemic of prescription drug abuse. The only thing stopping the wide dissemination of these substances is the fact that they're very expensive.

When injured patients are prescribed a large quantity of addictive prescription drugs, this can sometimes correlate to a high number of abuse issues. These cases of abuse are not just individuals using the drugs to get high, but are also those simply trying to rid themselves of their current pain. By all means, people shouldn't be scared to take pain killers; they're greatly needed for more extreme injuries. Patients should respect them, be aware of their addictive properties and only take the prescribed quantities. Doubling doses and mixing drugs can lead to dependency — or even death.

Pain killers at parties are becoming commonplace, and individuals taking them may not fully understand their inherent dangers or may not care about the risks and consequences. The substances are often mixed with alcohol or crushed to be snorted or injected to make the drugs' effects more potent. We see large numbers of overdoses when these drugs are snorted or injected, which can often lead to death. Mixing pain killers with alcohol can slow breathing to an unhealthy rate causing life-threatening respiratory depression. This can also occur when mixing pain killers with antihistamines, barbiturates or benzodiazepines.

Abuse is all too easy with prescribed pain killers. Proper awareness and use can avoid their life-threatening effects.

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Winter may thaw into spring as in the next issue of Wingman ... Safety doesn't get that option.

Safety is NO accident in any season!

U.S. Navy photo