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FLYING Safety

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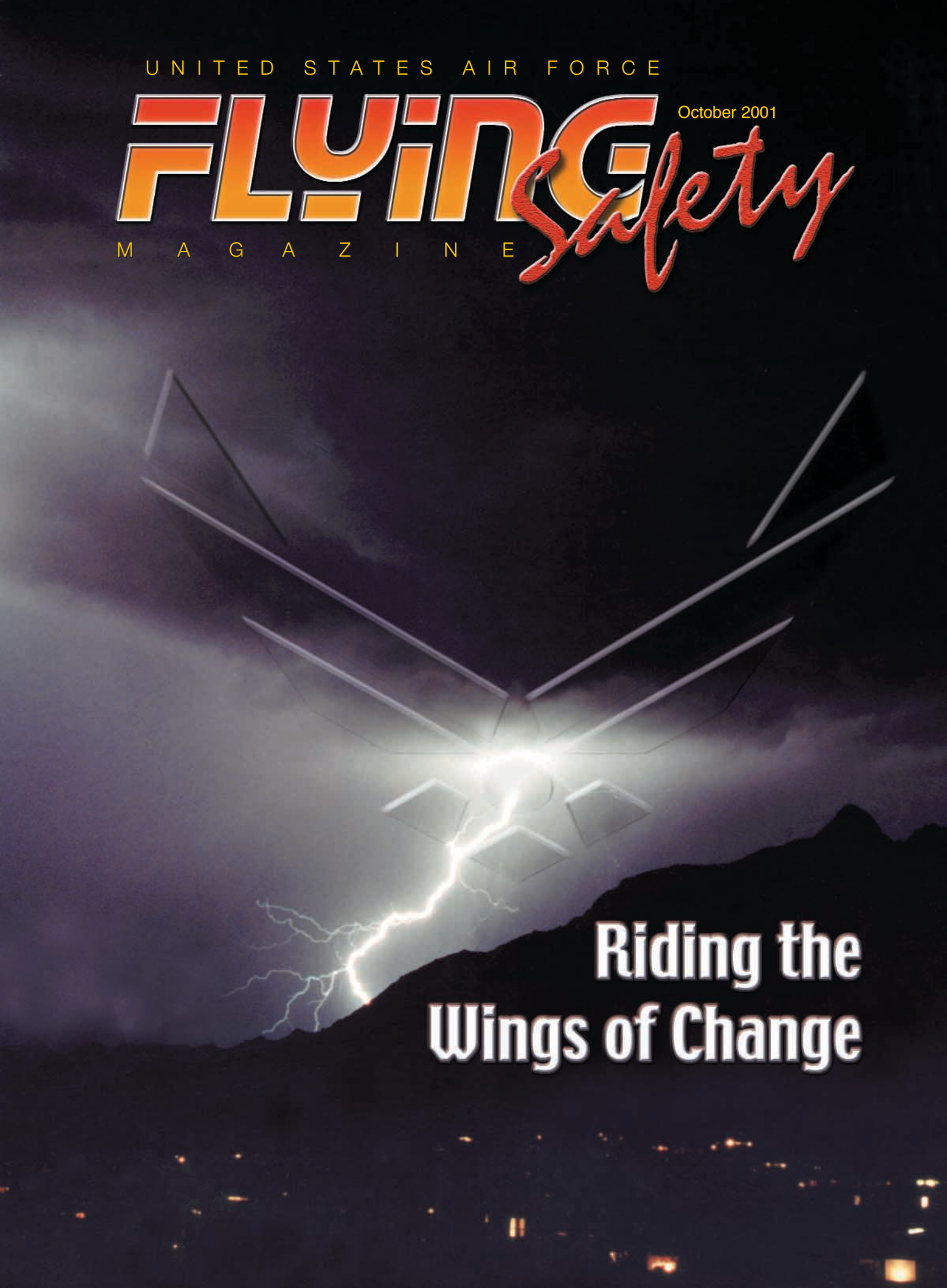
October 2001



Riding the Wings of Change

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Cover: Photo and Photo Illustration by Dan Harman

UNITED STATES AIR FORCE
FLYING Safety
MAGAZINE

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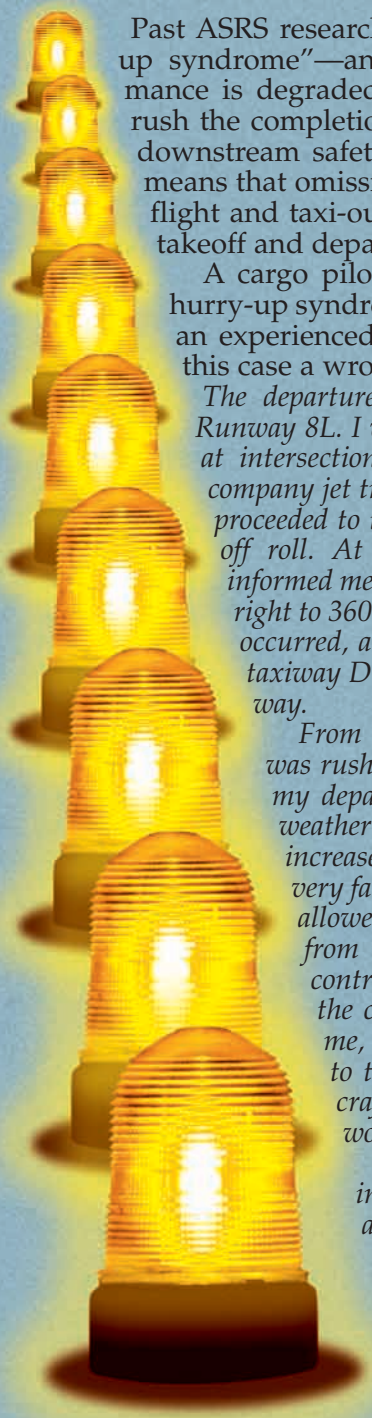
FSM notams

THE HURRY-UP SYNDROME REVISITED

Courtesy ASRS *Callback* #254, Oct 00
NASA's Aviation Safety Reporting System



Past ASRS research has documented that the "hurry-up syndrome"—any situation in which pilot performance is degraded by a perceived or actual need to rush the completion of cockpit tasks—often results in downstream safety incidents. In practical terms, this means that omissions or oversights made during preflight and taxi-out often manifest themselves during takeoff and departure.

A cargo pilot's report to ASRS shows how the hurry-up syndrome and complacency can lead even an experienced pilot to make a novice's error—in this case a wrong-direction departure:

The departure ATIS was calling for departure on Runway 8L. I was cleared to taxi and hold short of 8L at intersection D for intersection departure behind company jet traffic. Tower cleared me for takeoff and I proceeded to turn onto the runway and started takeoff roll. At approximately 500 feet AGL, Tower informed me I had departed runway 26R and to turn right to 360° and then on course. No traffic conflicts occurred, and there was no shortage of runway as taxiway D is at the midpoint of a 10,000 foot runway.

From the beginning of the taxi for takeoff, I was rushing for departure and preoccupied with my departure preparations. I was late and the weather was moderately low, all factors that increased my anxiety and haste to depart. I am very familiar with the airport and I believe this allowed complacency to set in. The departure from midfield made it difficult for the ATC controller to anticipate my mistake...[Also] the company jet did not take off in front of me, but crossed Runway 8L/26R on the way to the south set of runways. No other aircraft were taking off or landing, which would have warned me of my mistake.

- *Allowing oneself to be rushed increases chances for mistakes to happen and go unnoticed.*
- *Be suspicious and think through intersection departures. Check heading indicator on line-up to verify departure runway. Slow down to allow the controller to stay in the loop and help avoid mistakes.*

Air Force Weather:
Riding the Wings of Change

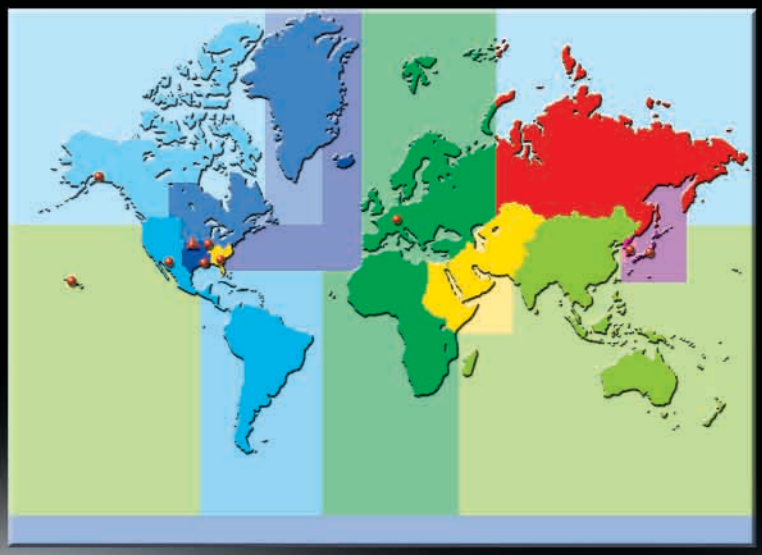
BRIG GEN DAVID L. JOHNSON
Director of Weather, AF/XOW
Deputy Chief of Staff/Air and Space Operations Headquarters USAF
COLONEL TIM MINER, AFRC
Reserve Assistant to the Director of Weather

We had to increase the effectiveness of our people during times of shortage.

Photo and Photo Illustration by Dan Harman

Last year I was placed in charge of a team of dedicated professionals who are committed to YOU. They are the men and women of Air Force Weather who are working hard to bring you the most accurate, up-to-date and operationally relevant weather information for your needs. After spending the last twenty-five years as a customer of weather products, I now lead your weather providers. Air Force Weather has a clear vision and is past the midpoint in completing our reengineering efforts for the future. As a fellow aviator, I owe you a PIREP on how we are doing.

As you may remember from articles in *Flying Safety* magazine in 1997 and 1998, Air Force Weather started reengineering in August 1996 with three goals in mind. One, we had to increase the effectiveness of our people during times of shortage. Two, we had to change the infrastructure to create the best weather information in the world. And three, we had to create a delivery capability that would get that information to you anywhere at any time. These three goals are still our targets, and they are the standards we want you and senior Air Force leadership to judge us by. So, where are we in 2001?



USAF Photo

We no longer have observers, only weather technicians who have better forecasting skills and tools.

USAF Photo by SSgt Scott Stewart

First, we had to increase the effectiveness of our people. They are truly our most important resource. When we began our reengineering, we had a shrinking pool of talent, which decreased job satisfaction and caused burnout from higher-than-ever demands on time and skills. We know that human factors issues like these apply to all personnel who make aircraft operations possible, and they play a critical role in aviation safety. As your weather provider, we had to change to be safe and operationally effective.

Effective two years ago, all enlisted weather technicians now come from a revised career track. New recruits first go to their technical training initial skills course at Keesler AFB, Mississippi. After graduation, they are assigned to one of our new regionally-oriented Operational Weather Squadrons (OWSs) where they undergo intensive on-the-job training

continued on next page

with our most experienced forecasters and meteorologists. Only when they have gained this comprehensive experience with all our weather products and processes will they be assigned as forecasters for your flying unit. We no longer have observers, only weather technicians who have better forecasting skills and tools. Today we have some very good technicians in training at the OWSs who are already the best "new guy" weather resources your unit has ever had—but gaining experience still requires time.

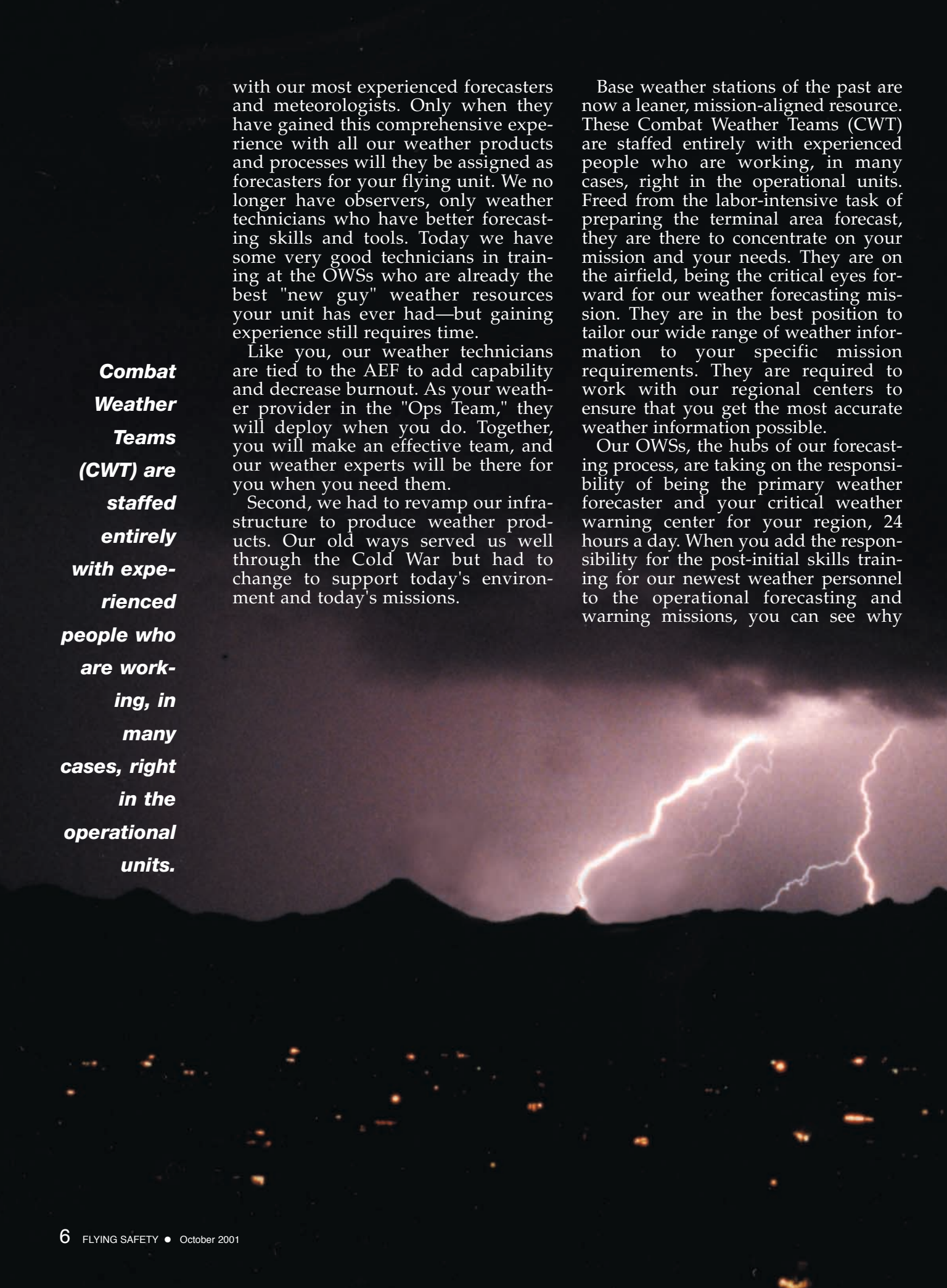
Like you, our weather technicians are tied to the AEF to add capability and decrease burnout. As your weather provider in the "Ops Team," they will deploy when you do. Together, you will make an effective team, and our weather experts will be there for you when you need them.

Second, we had to revamp our infrastructure to produce weather products. Our old ways served us well through the Cold War but had to change to support today's environment and today's missions.

Combat Weather Teams (CWT) are staffed entirely with experienced people who are working, in many cases, right in the operational units.

Base weather stations of the past are now a leaner, mission-aligned resource. These Combat Weather Teams (CWT) are staffed entirely with experienced people who are working, in many cases, right in the operational units. Freed from the labor-intensive task of preparing the terminal area forecast, they are there to concentrate on your mission and your needs. They are on the airfield, being the critical eyes forward for our weather forecasting mission. They are in the best position to tailor our wide range of weather information to your specific mission requirements. They are required to work with our regional centers to ensure that you get the most accurate weather information possible.

Our OWSs, the hubs of our forecasting process, are taking on the responsibility of being the primary weather forecaster and your critical weather warning center for your region, 24 hours a day. When you add the responsibility for the post-initial skills training for our newest weather personnel to the operational forecasting and warning missions, you can see why



these units require our most experienced weather technicians. By using a concentration of people, high-tech tools and equipment, our hubs will provide you with the basic weather information to conduct safe and successful aviation operations. All aviators and our forward-deploying CWTs will "reach back" to regional hubs to get the weather information you need.

Our Strategic Centers have the "big picture" level of our weather process. With the creation of the Air Force Weather Agency (AFWA) at Offutt AFB, we've created a "super center" to collect, analyze and distribute the worldwide observations, pilot reports and other data necessary to model the environment you operate in. Here, we have a very large computing capability working for you. Right now we are also transferring the "space weather" mission from Colorado Springs to AFWA in Omaha. In aviation, no matter what weapon system you fly, you are influenced by space-based weather events. For example, your GPS navigation and your communications capabilities are impacted whenever the sun emits higher energy levels than normal. Your "preflight weather" will soon include "mud to sun" information, and it is the strategic center, working through regional hubs to your local combat weather team, that will make all this possible.

So our reengineering effort is on course, at the local, regional and strategic levels. We are about a year away from completing this process.

Third, getting the weather information you need is a pass/fail process. At your local unit, the CWT is there as your mission-focused resource. When you are away from the home airport, the regional hub is the provider of information, since the hubs have a broader perspective. There is always someone waiting to meet your weather needs under the reengineered Air Force Weather.

While we are pressing to the target it's only fair for you to ask how we're doing. What's the bottom line?

We're doing very well. By pooling our resources at regional hubs and providing high-tech tools and equipment, we've been able to decrease our footprint overseas while maintaining our capability. Personnel shortages are decreasing, and we have new weather technicians gathering the experience to serve you even better. While we are not CAVOK in the weather business yet, the trends are all good.

In closing, let me emphasize two important points that are critical to you.

First, AF Weather is a team operation that demands the best knowledge of the scientist at Offutt AFB, the best capabilities of the forecaster at the regional hub and the mission knowledge and expertise of your local CWT expert to provide you with the most accurate weather information we can give you. Every forecast has lots of professional fingerprints all over it.

Second, you are an important part of the new weather team. Local CWTs are depending on interaction with you to enable a better forecast for the mission. It is the local CWT that filters through the tremendous quantity of information available (from hemispheric satellite photos to microclimate forecasts for the day after tomorrow) to better equip you to accomplish your mission. Make your weather folks an important part of the Ops Team—you'll need them to anticipate and exploit the environmental "fog of war."

There is always someone waiting to meet your weather needs under the reengineered Air Force Weather.

Photo by Dan Harman

Five + One Equals...

HQ AFSC Photo by TSgt Michael Featherston
Photo Illustration by Dan Harman

Brandnewbie returned with the replacement center-gear pin. And he installed it.

MSGT MICHAEL "THEO" THEOCHARIDES
305 AMW/SEF

There They Were… A KC-10 aircrew was preflighting for a local, night training sortie. When the time came to pull the landing gear pins, Airman Brandnewbie, a young, ambitious three-level airman, noted that the safety pin for the center gear was bent. He told Sergeant Longtime, the lead Crew Chief, who directed Brandnewbie to go to the AGS tool crib and get a new center gear pin. While Brandnewbie was away getting the replacement gear pin, Longtime showed the KC-10's FE that all five landing gear pins—two from the nose, and one each from the left, center and right main landing gear—were now removed.

Brandnewbie returned with the replacement center-gear pin, just as the crew was preparing to close the aircraft and get serious about launching. *And he installed it.* (You can already tell where this story's going, can't you?) As the flight crew was wrapping up final

preparations, Longtime joined them inside the aircraft to monitor their progress (and maybe shoot the breeze a little, too). Just as Brandnewbie was about to board the jet and gain valuable experience in shooting the breeze, Longtime asked him, "Did you move that stand away from the right wing?" Inwardly disappointed he wouldn't be able to hang out with his mentor and idol, the understudy did an immediate about face and commenced moving the stand, with assistance from Airman Marshaller, another, more experienced Crew Chief who had just been dropped off by the Expediter.

Marshaller asked Brandnewbie, "Would you like to block the aircraft out while I stand behind and give you instructions?" Like a kid offered the keys to a candy store, Brandnewbie got this big grin on his face and said excitedly, "Heck, yes!" Barely concealing his enthusiasm, Brandnewbie proudly put on the marshalling vest, checked out the marshalling wands to make sure they were ready for his first nighttime block out and took his post well out to the front of the KC-10's nose. At about the same time, Longtime exited the aircraft and was walking down the air stairs as the aircraft's cabin door closed behind him. With the stand at the right wingtip now cleared, Marshaller informed Longtime that he would be instructing Brandnewbie in the finer points of blocking out an aircraft. Longtime okayed the plan, and he and Marshaller commenced clearing the air stairs from the aircraft.

Once the area around the aircraft was cleared of all AGE, Longtime hooked up on ground interphone to finish up launch checks. Just a short time later, Brandnewbie was gratified to hear the powerful GE fan engines starting. He knew his proud moment was just a flash of the nose gear landing light away *(A signal the Aircraft Commander's ready to taxi. Ed.).* "There it is!" Brandnewbie raised his arms in a full "X" and watched closely, waiting for Longtime to come off interphone and clear the aircraft. Once clear, Brandnewbie started waving his wands back and forth, slowly and methodically, signaling the AC to commence taxi. Marshaller raised his voice loud enough to be heard over the engine noise and said "Pick up the pace Brandnewbie!" then, "Okay, now start signaling a hard left turn."

Longtime observed it all from a position off the right wing, watching proudly as his three-level flawlessly blocked the aircraft out. Just as the underbody strobe light came on, he saw Brandnewbie assume the position of attention and render a smart salute and "Good flight!" to the crew. Marshaller patted Brandnewbie on the back as they walked back to the now-vacant parking spot to check for FOD and joined up with Longtime for a critique as they waited for the Expediter to swing by and pick them up.

Twelve minutes later, riding in the Expediter truck and on the way to work other jobs, the Maintainers heard the following transmission over the radio: "KC-10, tail number XX-XXXX, is returning to base with a center gear that won't retract."

Longtime turned to Brandnewbie, studied his face for a long moment, then asked: "By the way, Airman Brandnewbie. Where's that new center gear safety pin I sent you for?"

Epilogue

There were conflicting opinions on whether or not the replacement center gear safety pin had a "Remove Before Flight" streamer attached, but none of the three members of the launch team observed a streamer in the vicinity of the center gear flapping in the breeze. Of course, it *was* a night launch, too. What is known is that there wasn't one attached when the aircraft landed after the air abort. As a result:

- Sergeant Longtime was counseled on the importance of supervisory oversight and accountability.
- Airman Marshaller was counseled on the finer points of being more observant.
- And Airman Brandnewbie? He received remedial math and now clearly understands: Five Plus One *DOES NOT* Equal Five.

A note from the author: Yes, I *did* embellish parts of this story to keep your interest, but the events were real, and the names were unimportant to its telling. This event could have happened to anyone. Don't let it be *you*! ✈

"KC-10, tail number XX-XXXX, is returning to base with a center gear that won't retract."

Situational Awareness (Lucky or Good?)

USAF Photo by MSgt Herman J. Kokojan
Photo Illustration by Dan Harman

Why do the more experienced pilots tend to have better SA?

CAPT PETE WILKIE
8 FS
Holloman AFB NM

It was 0300 hours local PSAB time as our two-ship was pushing into southern Iraq for another Southern Watch night sortie. I was a young, mission-ready F-16 pilot flying with an experienced instructor pilot. My assigned radar search volume limited me to keeping track of lead only with my FLIR and air-to-air TACAN. I misprioritized my attention and soon realized I had lost situational awareness (SA) of lead's position…evident by the increasing DME. My next action was to admit loss of SA. I called out "blind."

Sound familiar? Or what about the airman who is chastising ATC as he is sent around the pattern, only to realize he has had a "hot mike" all the while? Have you ever lost SA, or realized that your SA had been "down the tubes" all along? Why do the more experienced pilots tend to have better SA? What's their secret? Are they lucky, or are they "just that good"?

SA is like the white buffalo. We can all recognize SA when we see it, but mystery still surrounds what it actually is. AFI 11-290, *Cockpit and Crew Resource Management Training Program*, defines situational awareness as the "continuous perception of self and aircraft in relation to the dynamic environment of flight, threats, and mission, and the ability to forecast, then execute tasks based upon that perception." For me, a simpler definition is "SA is knowing what's going on around you."

Dr. Mica Endsley (expert on human factors and situational awareness and president of SA Technologies in Marietta GA) defines situational awareness using three cognitive levels. Level one is *Perceiving*. At this level, you are reacting to what is happening around you ("behind the jet"). Level two is *Comprehending*. At this level, you understand what is going on and are able to understand events ("with the jet"). Level three is *Projecting*. At this level, you are able to be proactive ("ahead of the jet").

A way of thinking about these levels is by using an emergency procedure (EP) example. If the EP is new or unfamiliar, then I'm reacting to events well after they unfold and after I've had time to analyze them (Level One). If I have basic knowledge of an EP, then I'm able to react almost immediately to events as they occur (Level Two). If I have experienced the EP before and have a full understanding of the EP and its implications, then I'm able to anticipate the

events before they unfold (Level Three).

Comfort level in the cockpit likely increases as the levels increase. But "comfort" can be beneficial or detrimental. "Comfort" allows you to perform flying routines automatically (beneficial). "Comfort" also allows you to fly into the ground in a relaxed state when your SA is relatively low (detrimental). Loss of SA occurs when one of the interlocking levels (see diagram) does not reflect what is really happening.

So what's the big deal about losing SA? According to Mr. Perry Nelson, an egress specialist from Brooks AFB, "The most frequent cause of a delayed ejection (or no attempt to eject) is the loss of situational awareness" ("Egress Systems: What's New," *Flying Safety*, Oct 00). You see the world as you see it, not as it is. A false perception can rapidly lead to death when you're traveling at the speed of stink.

Internal and external factors can lead to the loss of SA. Internal factors may include personal issues spilling over into flight, channelized attention, complacency, task saturation, lack of job knowledge, lack of flying currency and personality conflicts, just to mention a few. Some external factors affecting SA include poor communication, unexpected events, automation error, adverse weather and system errors. How can we combat these SA "dumpers"?

I think of SA in three closely related parts: flight awareness, system awareness and environment awareness. The first two parts we have control over. The last part we have little control over; we mostly react.

The most familiar part of these concepts is "flight awareness." Flight awareness deals with the interaction of people. It applies to the interaction between flight members, regardless of whether they are in the same aircraft or one of the wingmen in spread formation. Are these people acting the way they were briefed and IAW the expected norm? Do the comments made convey an accurate "picture"? Are the comments useful and timely? Does the pacing of tasks match up with what is "standard" or briefed? Are tasks executed correctly? Flight awareness becomes obvious as events unfold through actions and radio transmissions.

"System awareness" may be defined as simply knowing what your aircraft's instruments and systems are telling you and how it relates to the mission. Publications are the foundation of system awareness. These provide ops limits and general flight rules, among other information. The ability to correctly process systems information defines the pilot's system awareness.

The last part of the SA picture is "environment awareness." This part includes all of the uncontrollable factors, such as target area weather and enemy formations or actions. I can increase my environment awareness by planning for these factors with predetermined options (i.e., weather backup attacks), but I can't directly control them. The ability (or inability) to react rapidly becomes apparent during this part of a mission.

As airmen, we can gain SA by developing two overlapping areas—preparation and experience. Preparation includes studying and understanding publications, comprehensive flight planning and thorough briefings. Experience includes flying/simulator experience and learning from the experiences of other aviators. Reading safety articles in publications such as *Flying Safety* is an excellent way to do this, but Friday afternoon war stories at the club can be just as good.

Without both preparation and experience, tactical lessons and execution fall short of ideal. The mission may come off "as fragged," but the learning curve remains stagnant.

Perhaps the next time someone makes a comment about your "low SA," you can ask yourself how you ended up in that state. "Where did the breakdown occur? How did it happen? How can I correct the lack of SA?" In my example from above, I was able to correctly perceive my loss of SA on lead's position. Safety, good airmanship and ROE dictated that I inform lead. Preparation and experience work to combat a less-than-desirable level of perception. As aviators, we must take the time to get to know our mission, our aircraft's systems and our environment. The old saying, "Proper planning prevents poor performance," directly applies to situational awareness. In either case, whether you're "lucky or good," safe flight begins—and ends—with you.

As airmen, we can gain SA by developing two overlapping areas—preparation and experience.

HQ AFSC Building Photo by Gerald C. Stratton

One of the biggest problems with putting information on a Web site is, if people don't go to the site, they don't know what's there.

MAJOR (CAF) KURT J. SALADANA
HQ AFSC/SEFF

One of the major criticisms we hear at the AF Safety Center (AFSC) regards the distribution of information. The complaint is valid. Unfortunately, lessons learned from mishap investigations are often slow to reach many operators and maintainers because of the legalities involved with handling privileged information. We are working to correct this by making mishap briefings available for safety days through MAJCOM safety offices. The Safety Center's Aviation Safety Division also publishes "Blue 4 News," a monthly synopsis of current and recent flight Class A mishap investigations, but this is also privileged and not necessarily available to everyone who might benefit from the included "Lessons Learned."

To further distribute safety information, the Safety Center also produces *Flying Safety* and *Road & Rec* magazines, but publishing lead-times create a gap between the writing of articles and their reaching the audience. We're happy that the articles are being read, but we'd be downright ecstatic if USAF personnel and employees received the intended message much more quickly.

We also receive a lot of information here that is pertinent, valid and interesting but, until recently, there was no way to pass it along to you, who would potentially receive huge benefit. This has changed with the maturation of the Internet, widespread accessibility to it and, more importantly, with the introduction of policy and training that permitted us to create our own Web sites and publish information and links to other sites.

One of the biggest problems with putting information on a Web site is, if people don't go to the site, they don't know what's there. It's like that rule that crops up every now and then in local flying regulations that prohibits pilots from flying someplace if they've never been there before. So, how do we get around this problem? Well, even though we realize that a large number of people won't read this article until months after it's written, the message will still be the same: "Visit the AFSC Web site!"

What's on the Web site? Start with the AF Safety Center homepage http://safety.kirtland.af.mil/. Of particular note is

the "Safety Crossfeed" link, which will take you to http://safety.kirtland.af.mil/AFSC/crossfeed.htm. "Crossfeed" is a forum for distributing mishap prevention information throughout the safety community. It's a great tool for sharing safety-related information such as lessons learned, checklists, best practices, training materials and other relevant safety items. You'll see links here to Flight, Ground, Weapons and ORM Crossfeed pages which each contain a variety of pertinent information and an e-mail address for feedback or submissions. "Weather Training" is a link recently added to the "Flight" Crossfeed Web page. It takes the user to the National Weather Association (NWA) home page at http://www.nwas.org/ which currently offers an excellent tutorial course regarding thunderstorms and the related dangers of flight in severe weather.

Going back to the AF Safety Center home page and selecting "Organization" provides further links to each of the Safety Center's divisions. Each division provides a mission statement and a list of personnel and telephone numbers, with additional links to offices within the division.

We could provide a list of every type of information provided at every link but, by the time you read this article, the list might be outdated. Our plan is to keep the Safety Center Web site up to date and add information as it becomes available. If there's anything you'd like to see added, let us know and we'll do our best to get it onto the site. Likewise, if you have comments or criticisms, please send them to us—this is an Air Force Web site and we want to make it as useful and useable as possible. The bottom line of everything we do at the AF Safety Center, including mishap investigation, is to improve safety while preserving operational capability. We believe that, with your inputs, our Web site can help us do just that.

By the way, if you follow the link to "Safety Magazines" on the AFSC home page, it will take you to current and past issues of *Flying Safety* and *Road & Rec* magazines.

Maj Saladana was the Canadian Air Force exchange officer to AFSC until Aug 01 and has contributed many articles to Flying Safety Magazine.

Our plan is to keep the Safety Center Web site up to date and add information as it becomes available.

Twice In One Day!

"Hey, Pilot, the prop is spinning backwards," the loadmaster said.

LT COL JAMES M. KOHHLER
166 AW/OGV
Delaware Air National Guard

"Crew, we're going around!"
"I'm setting max power!"
"Flaps 50 percent!"
"Positive rate—gear up!"
"Flaps 20!"
"Flaps up!"

I couldn't believe we were actually doing an engine-out missed approach for the second time that day, with the ceiling now below 200 feet and less than one half-mile visibility. The weather was forecast to be 1500 feet overcast and visibility seven miles in mist when we stepped to the aircraft. Besides, the Supervisor of Flying (SOF) was going to keep a sharp eye out for any weather changes. But our Herk was now climbing into the opaque clouds, having missed the Instrument Landing System (ILS) approach with only three engines running.

The mission was a Functional Check Flight (FCF) with a very experienced crew. The maintenance folks had worked on the engines, which necessitated an FCF before releasing the plane to the line crews.

The crew had been to Quality Assurance (QA) to get a detailed briefing on all of the wrench-turning that had been completed on the aircraft. The engineers and loadmaster had completed a thorough preflight. (The engineer also noticed that a green M&M was still in the crack near the copilot's seat. It had been there since the last AEF deployment.)

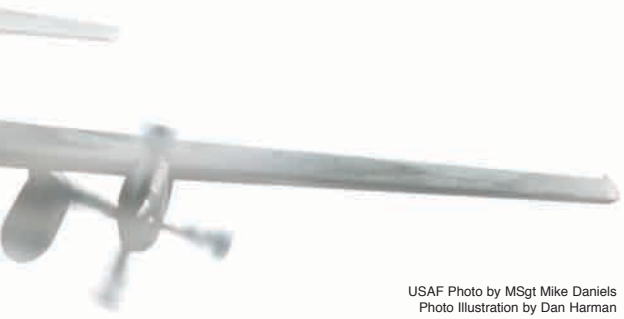
The nav and pilots filed the flight plan and received a thorough weather briefing. Granted, February weather in the Northeast is not always nice, but the present weather and forecast were good enough for the test flight. Heck, the weather was VFR! All we had to do was climb to altitude, shut down and restart each engine one at a time, and then head for the barn. This was going to be a quick one. I would get to my civilian job by 1600 with no sweat. I might even make it to the snack bar before it closed for lunch.

The FCF was going very well until we got to the number four engine.

"Condition lever, number four engine, feather."

"How does she look, Load?"

"Hey, Pilot, the prop is spinning backwards," the loadmaster said.



USAF Photo by MSgt Mike Daniels
Photo Illustration by Dan Harman

"OK, the prop brake didn't engage," quipped the pilot. "I'll start to slow down a bit."

The whole crew felt a sudden shudder and thump as the backward windmilling gearbox suddenly seized and the prop stopped. (That meant I would almost certainly get back in time to get that hot dog at the snack bar.) Like a good copilot I declared an emergency, and we headed for the home aerodrome. I accepted the fact that some days you're the pigeon and some days you're the statue. Today we were the statue.

The ATIS (Automatic Terminal Information Service) was still broadcasting decent weather, and we elected to shoot the VOR approach to runway 27. Then we heard the aircraft in front of us go missed approach on the VOR due to low ceilings. The ceiling was coming down really fast, but that was no problem for an old, gray-haired crew like us. With "flexibility" being the key to air power, we simply asked for the ILS approach to runway 01.

The Gulfstream jet that had gone missed approach in front of us made it in on the ILS but reported to the tower that weather was at minimums. I kept looking around the cockpit. There's always something that you've missed, and we were flying with one engine shut down in hard IFR weather. We set up for the ILS. At 100 feet above minimums, it hit me that we may actually go missed approach. At minimums, we did a three-engine go-around. As I called the go-around, I finally saw the approach lights and the runway, but it was too late. We were already climbing into the soup. Our "reality check" had just bounced.

We were getting in a little bit of a bind but decided one more try would be reasonable. I thought back to my training and remembered my instructor telling me takeoffs are optional but landings are mandatory. It's days like this that you think about being down on the ground wishing you were up here, instead of up here wishing you were down on the ground. This was starting to be no fun. Some people think a prop is just a big fan in front of the airplane to keep the pilots cool. I think that's true, because when it stops you can actually watch the pilots start to sweat. We were beginning to sweat.

The second approach looked just like the first one. We saw the runway while we were "on the go." As we executed the missed approach, the SOF told us that Dover AFB was above minimums, so away we went to our alternate.

We made a long straight-in approach on the ILS. I'm told that the probability of survival is inversely proportional to the angle of arrival. A large angle of arrival equates to a small probability of survival. Our angle of arrival was a three-degree glideslope, which I guess should mean a 97 percent chance of survival. The old beast took care of us that day, even though Mother Nature had given us a challenge. We landed without further incident.

As we waited for a ride back to our home base, I did get to the snack bar and had that hot dog. On the long ride home, the crew had a chance to discuss the day's events. We had done everything right, but we still ended up in a little bit of a pickle. I still can't believe we did a pair of engine-out approaches, in the weather, in one day, but good training and experience helped us give the story a positive ending. Fly Safe!

Some days you're the pigeon and some days you're the statue. Today we were the statue.

BASH: An Autumn Reminder

BIRD AIRCRAFT STRIKE HAZARD

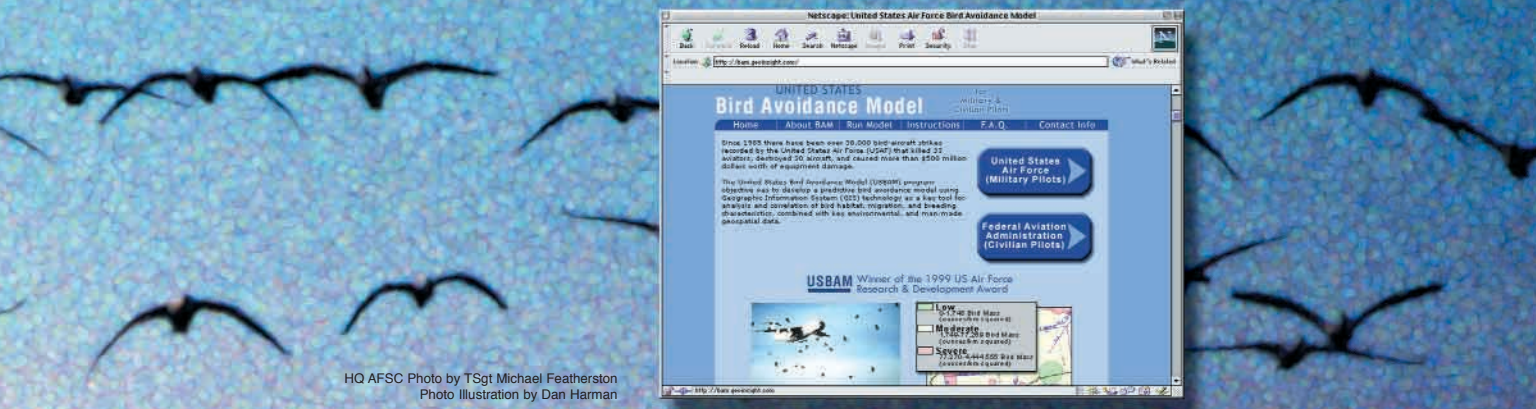
MR. GENE LEBOEUF
HQ AFSC/SEFW

October is already upon us. It is a time of fall colors, Halloween, cool weather and, for aviators, a time of bird migrations and other wildlife visitations. By now all bases with flying missions should have already had, or should have on their immediate schedule, their Bird Hazard Working Group (BHWG) meeting. The BHWG is the best opportunity for all the diverse groups who have anything to do on or near the airfield to sit across the table from one another to discuss plans that may affect flight operations. This could include any subject from construction projects planned by CE to the Golf Course manager's plans to keep geese away from his precious greens. If you are a tenant sharing the airfield with civilian operations, it's a good time to schedule a meeting with the host operations office to discuss protocol for dealing with wildlife hazards.

This is also the time to review personnel changes to identify any new recruits that may not be "up-to-speed" on BASH procedures. The middle of an assault from our feathered friends is no time to work out disconnects. Review office procedures; make sure everyone understands response protocols. Revisit Bird Watch Condition (BWC) codes (low, moderate and severe) and who is responsible for changing the code. Those tasked with strike reporting should be familiar with the latest Safety Automated System (SAS) reporting. It is also wise to walk new employees through a good review of the airfield. Take them around the airfield to familiarize them with those areas frequented by birds and other wildlife.

A quick check of all appropriate equipment should be done at this time to make sure your gear is ready when the time comes to employ it. If you have propane cannons, inspect the hoses for dry rot. Inspect propane cylinders to make sure they are safe for use and full of gas. If any other devices are used, such as remote control aircraft, check to be sure they are functional and peripheral supplies are on hand.

Perform an inventory of your pyrotechnics. You should have a supply of 12 gauge "cracker shells," 15 mm pyrotechnics and a launcher. A good starting amount would be to have two boxes of cracker shells and 100 rounds each of racket bombs (screamers) and bird bangers. Remember that cracker shells are fired from a 12-gauge shotgun, so you must have access to one. There may be one assigned to the flight line, or you may have to check one out from the Security Forces Squadron armory. A single-shot gun is best, but a pump action will work; just remember the pump will require more intensive cleaning. If pyrotechnics are used, plan a trip out to the airfield for a currency check to assure those tasked to use pyrotechnics are familiar with proper use.



HQ AFSC Photo by TSgt Michael Featherston
Photo Illustration by Dan Harman

If lethal control methods are employed, you will need a federal depredation permit. Although these permits were suspended for a period of time for federal employees on federal lands, they are once again *required* before shooting any migratory bird. A depredation permit may be obtained from the United States Fish and Wildlife Service (FWS). Contact information for the FWS Regional office in your area may be found in AFPAM 91-212, *BASH Management Techniques*. State permits for any non-migratory bird or resident animal, where applicable, may also be necessary but will vary by state. Remember: You must document why a depredation permit is necessary. In other words, you must try non-lethal techniques before applying for a depredation permit. You should only use lethal control methods after non-lethal techniques have been exhausted without achieving an acceptable level of safety.

With all the electronic products available from the BASH Team, it is worthwhile to refresh your memory on how to access these sites. Visit the Web site and familiarize yourself with where to find information, from regulations to actual control techniques.

Visit the Bird Avoidance Model for your airfield. By checking through the 26 two-week periods, you have a window into 30 years of historical data of when migratory birds come and go at your particular location. This information can be used when assigning your Phase 1 and 2 time periods. Our Avian Hazard Advisory System (AHAS) should now be up and running, covering the entire CONUS. This on-line service provides bird activity predictions based on NEXRAD weather radar on a near-real-time schedule.

If you follow this list of checks and reviews, you should be ready for this year's migratory season. Being prepared will always make for a safe, professional operation. Just keep in mind that wildlife hazard management is not a perfect science, and persistence is an absolute necessity. The best program is one that is flexible and functional. Remember this, too: Even the best program may result in a BWC warning to pilots that now is *not* the time to fly. We cannot eliminate the wildlife in and around the airfield, but by being prepared and vigilant we can reduce the hazard.

It's a good time to schedule a meeting with the host operations office to discuss protocol for dealing with wildlife hazards.

You Pick:
Cheap Lesson or Expensive Mishap

The horrifying perception that five of my squadronmates could have been killed hit me like a Mack truck.

LCDR CHRIS PLUMMER, USN
Reprinted from *Approach*, April 2000

"Wake up. Wake up, boss. We gotta talk." That plea came from my roommate, the MMCO (Maintenance and Material Control Officer), early one morning as we neared the end of a six-month cruise in the Persian Gulf. As I tried to shake off the previous night's sleep, he showed me a small aspirin bottle.

I blankly stared at him and the bottle, at a total loss until he showed me a digital picture of the same aspirin bottle wedged between some cables. When I realized I was looking at flight-control cables, the horrifying perception that five of my squadronmates could have been killed hit me like a Mack truck. I was awake now.

The MMCO said that the bottle had been discovered the previous night during a Phase B inspection. Had we been skirting death on every flight since the beginning of the cruise, or had the bottle just recently found its dangerous resting place, spelling disaster for the next crew who manned this marked Hummer? Regardless, a timely maintenance inspection and an astute airframer might have prevented losing an aircrew and aircraft.`

This aspirin bottle was wedged against a rudder cable in the nose of the aircraft, behind the pilot's rudder pedals. It undoubtedly lodged there after flying forward during an arrested landing. The phase inspection also produced a metal fastener from a helmet and a small radio knob. The helmet piece and the aspirin bottle had no outstanding MAFs (Maintenance Action Form). The radio knob did.

As squadron maintenance officer, I had noticed a disturbing trend the past year, and this discovery, unfortunately, fit right in. Items brought into the aircraft by aircrew remained unaccounted for until discovered by maintenance personnel, whereas items lost by maintainers were scrupulously documented.

We have all heard the old maxim of naval aviation: FOD kills. Most of us carry things into the airplane—pens, grease pencils, nasal spray, cameras, loose change, whiz wheels, pocket knives. The list is endless. Unlike maintenance personnel, who account for everything they bring in and out of the aircraft, aviators are on a sort of honor system.

If an aviator stuffs an extra ballpoint pen into his helmet bag and forgets it, he'll only remember it when it comes flying out of his helmet bag on an arrested landing. The Naval Aviation Maintenance Program says the FOD Prevention Program is an all-hands effort and must be supported by every person assigned to the command. Ideally, aviators and maintenance troops alike should be equally accountable to the CO with respect to FOD. In reality, however, an aviator who leaves his kneeboard in the aircraft owes some PR (Parachute Rigger) a six-pack, whereas a trooper who leaves a flashlight in the aircraft goes to mast (*That's*

Photos Courtesy of Author

"punishment" for us Air Force types. Ed.).

You can't just say that aviators are above the law, because we are only hurting ourselves. We don't own these aircraft and are putting more than just our own lives at risk. The pen unintentionally left behind could kill your best friend and orphan his family.

I briefed our safety officer and the chain of command on the incident. Hours later, the safety officer showed all the aircrew the aspirin bottle and the pictures. The ready room discussed aircrew-induced FOD. The pictures of the bottle wedged behind the rudder cable had a sobering effect. We all brought our helmet bags to the ready room and purged them of loose, non-essential items. It was an invaluable lesson learned at no cost.

(It doesn't matter who FOD comes from. What does matter is that it's documented in the aircraft forms and found. Remember. The life you save may be your own. Ed.)

(LCdr. Plummer flies with VAW-117.)

The pen unintentionally left behind could kill your best friend and orphan his family.

PIREP-Net

COL TIMOTHY MINER, AFRC
Reserve Assistant to the Director of Weather, AF/XOW

This is the building. Rising five stories above the western shore of the Potomac River, it's the largest office building in the world. Its five-sided design uses enough telephone wire to wrap around the world four and one-half times. Sometimes we actually use some of that wire when Air Force aviators have a problem. That's where I come in. Under the wings on my uniform I wear a badge. I'm a meteorologist.

Dum-da-dum-dum.

The story you are about to read is true ('cause I said so!). Even my own name hasn't been changed to allow you to bother me with your problems when I'm trying to catch a nap.

Dum-da-dum-dum. Dum-da-dum-da-dummmm.

Illustrated by Dan Harman

It was 10:07 on a Tuesday morning. I'd just had my usual morning pot of coffee. Under those conditions, even the newspaper comics couldn't hold my attention for long.

It was my obnoxiously cheerful administrative assistant, Sergeant Pepper.

"Just the usual—a large bowl of popcorn with triple butter for dinner and an all-night, original Star Trek marathon on the television."

Just then the phone rang. It was an anxious aviator.

He identified himself as a pilot with an Air Force unit in the Midwest. He was searching for the icing PIREPs he gave on his flight only an hour ago. Seems his Operational Weather Squadron didn't have them to give out to other pilots in his unit.

The local civilian Flight Service Station didn't have them. Even the ATC center who "took them down" had no record of any such information.

continued on next page

He was obviously hurt, disappointed and perplexed that all his work didn't amount to a few crystals of frozen moisture on the wing of a supersonic fighter in the tropics. He asked if I would help recover his PIREPs or at least find out what happened to them.

I told him we would do our best. He then spent the next seven minutes describing each PIREP and the circumstances surrounding their disappearance. By the time I hung up the phone I had a pretty good idea where to begin looking for the lost information.

Sergeant Pepper looked sadly at me as the phone receiver hit the cradle.

According to the Air Force publications and the Aeronautical Information Manual, FAA air traffic facilities are required to solicit PIREPs when several conditions are reported or forecast. These conditions include: ceilings at or below 5000 feet; visibility at or below five miles (surface or aloft); thunderstorms and related phenomena; icing of light degree or greater; turbulence of moderate degree or greater; wind shear and reported or forecast volcanic ash clouds.

Pilots are urged to cooperate and promptly volunteer reports of these conditions and other atmospheric data such as: cloud bases, tops and layers; flight visibility; precipitation; visibility restrictions such as haze, smoke and dust; wind at altitude; and temperature aloft.

PIREPs should be given to the ground facility with which communications are established; for example, PMSV, EFAS, AFSS/FSS, ARTCC, or terminal ATC. One of the primary duties of the civilian EFAS facilities, radio call 'FLIGHT WATCH,' is to serve as a collection point for the exchange of PIREPs with en route aircraft.

If pilots are not able to make PIREPs by radio, reporting upon landing of the inflight conditions encountered to the nearest Air Force Weather, civilian AFSS/FSS or Weather Forecast Office will be helpful. Some of the uses made of the reports are:

"The ATC tower uses the reports to expedite the flow of air traffic in the vicinity of the field and for hazardous weather avoidance procedures.

The AFSS/FSS uses the reports to brief other pilots and to provide inflight advisories and weather avoidance information to en route aircraft.

"The ARTCC uses the reports to expedite the flow of en route traffic, to determine most favorable altitudes and to issue hazardous weather information within the center's area.

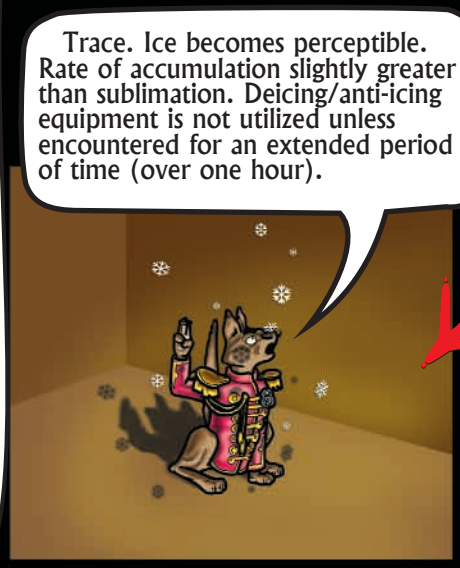
"The AFWA and NWS use the reports to verify or amend conditions contained in aviation forecast and advisories. In some cases, pilot reports of hazardous conditions are the triggering mechanism for the issuance of advisories. They also use the reports for pilot weather briefings.

The Air Force, NWS, other government organizations and private industry groups use PIREPs for research activities in the study of meteorological phenomena. However, they need to be in a standard format so that computers can collect and distribute the information in a timely manner.

All air traffic facilities and the NWS forward the reports received from pilots into the weather distribution system to assure the information is made available to all pilots and other interested parties. However, it is critical to remember that ATC's primary job is separating metal from metal in the sky. Pilots can help place priority on their information by addressing ATC facilities with the word 'PIREP' in their initial communication.

When it comes to icing, there are special terms that should be used. Be sure to give the type of aircraft to ATC when reporting icing. The following terms are the standard.

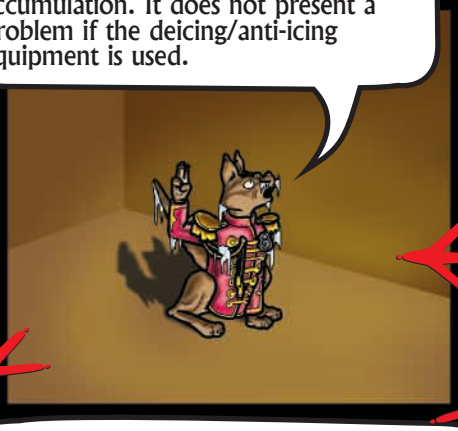
Be careful what you ask for. I shifted in my chair, he got his second wind.



* *Weather for Aircrews*

By 10:45 my worst fears were confirmed. A quick call to the Air Force Weather Agency in Omaha, Nebraska, and another to the National Weather Service's collection point at the National Center for Environmental Prediction, showed that Captain Cruedog's PIREPs never made it there.

Light. The rate of accumulation may create a problem if flight is prolonged in this environment (over one hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.



Moderate. The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or flight diversion is necessary.

Severe. The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate flight diversion is necessary.

Other important terms include the type of icing. These terms are rime ice, which is rough, milky, opaque ice formed by the instantaneous freezing of small supercooled water droplets; and clear ice, which is a glossy, clear or translucent ice formed by the relatively slow freezing of large supercooled water droplets.

Sergeant Pepper began ...

It was obvious to me that Sergeant Pepper had solved the case. Captain Cruedog had failed to use the word "PIREP" to get ATC's attention. He had failed to use standard terms to describe the icing conditions he was encountering. ATC took his information as an advisory and, busy with aircraft separation duties, failed to pass them along. This deprived AFWA and the NWS of vital feedback on their icing forecasts. If there was anything the aviation weather system needed, it was more PIREPs. This was a sad day.

It was eleven forty-five by now Dum-da-dum-dum. Dum-da-dum-da-dummmm.

Illustrated by Dan Harman

FY01 Flight Mishaps (Oct 00 - Aug 01)

21 Class A Mishaps
6 Fatalities
17 Aircraft Destroyed

FY00 Flight Mishaps (Oct 99 - Aug 00)

18 Class A Mishaps
6 Fatalities
12 Aircraft Destroyed

04 Oct	♣✶	An RQ-1 Predator UAV crashed while on a routine test mission.
12 Oct	♣	An F-16C crashed during a routine training mission.
23 Oct	♣✶	An RQ-1 Predator UAV went into an uncommanded descent.
13 Nov	♣♣	Two F-16CJs were involved in a midair collision. Only one pilot was recovered safely.
16 Nov	♣	An F-16CG on a routine training mission was involved in a midair collision.
06 Dec	♣	A T-38A impacted the ground while on a training mission.
14 Dec	♣	An F-16C crashed shortly after departure.
12 Jan	♣	An A-10A crashed short of the runway.
09 Mar	✶	During a ground maintenance run a KC-135E's No. 2 engine suffered catastrophic damage.
12 Mar	✶	A USAF NCO died during a range training mishap.
21 Mar		An F-16B experienced a bird strike but recovered safely. A fire developed after landing. The aircraft suffered structural and engine damage.
21 Mar	♣	An F-16C experienced engine problems soon after takeoff and crashed.
23 Mar		A C-17A sustained Class A Mishap-reportable engine damage. (Revised repair costs resulted in this mishap being downgraded to Class B mishap.)
26 Mar	♣♣	Two F-15Cs crashed during a routine training mission. The pilots did not survive.
03 Apr	♣	An F-16CJ crashed while on a routine training mission.
04 Apr		An F-15E on a routine training mission recovered safely after sustaining a bird strike.
07 Jun		A KC-10A sustained Class A Mishap-reportable engine damage.
12 Jun	♣	An F-16CG crashed during a routine training mission. The pilot was fatally injured.
21 Jun		A C-130H sustained Class A Mishap-reportable damage during landing.
06 Jul	♣	An F-16CJ crashed while on a routine training mission. The pilot was fatally injured.
17 Jul	♣	An F-16B flying a chase mission crashed. The two crewmembers suffered fatal injuries.
18 Jul	♣	An F-16CG crashed while on a routine patrol mission.
23 Jul	♣	An F-16DG crashed while on a routine training mission.
26 Jul	♣	An F-16C crashed while on a routine training mission.
13 Aug		An F-16C sustained Class A Mishap-reportable damage during landing.
16 Aug		A C-5A sustained Class A Mishap-reportable damage during takeoff.

- A Class A mishap is defined as one where there is loss of life, injury resulting in permanent total disability, destruction of an AF aircraft, and/or property damage/loss exceeding $1 million.
- These Class A mishap descriptions have been sanitized to protect privilege.
- Unless otherwise stated, all crewmembers successfully ejected/egressed from their aircraft.
- Reflects only military fatalities.
- "♣" denotes a destroyed aircraft.
- "✶" denotes a Class A mishap that is of the "non-rate producer" variety. Per AFI 91-204 criteria, only those mishaps categorized as "Flight Mishaps" are used in determining overall Flight Mishap Rates. Non-rate producers include the Class A "Flight-Related," "Flight-Unmanned Vehicle," and "Ground" mishaps that are shown here for information purposes.
- Flight, ground, and weapons safety statistics are updated frequently and may be viewed at the following web address:
  http://safety.kirtland.af.mil/AFSC/statspage.html
- **Current as of 16 Aug 01.**

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Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

"No, No, NO! Not My Red Shirt! Bring Me My Brown Pants!!!"

Near midair collisions. If you've ever been involved in one, the following accounts may evoke an all-too-familiar sense of déjà vu. If, on the other hand, you haven't experienced the rush of an NMAC because you always *aviate "by the book," these narratives are for you!*

Our skies continue to become more crowded, not less. USAF pilots filed 60 NMAC Hazardous Air Traffic Reports in CY98, 72 in CY99 and 71 in CY00. For just the first half of CY01, 47 NMAC HATRs have been filed, of which 20—more than 40 percent—were attributed to non-USAF pilot error. *Just because* you *aviate by the book doesn't mean everybody else does. It only takes one clown* not *aviating "by the book" to ruin your day. Permanently.*

Your best defenses against an NMAC? Know and follow the rules. Expect—and prepare, as thoroughly as possible, to deal with—the unexpected. Maintain SA, especially when operating in and around the airfield environment. If you encounter a hazardous condition, file an AF Form 651, Hazardous Air Traffic Report, so the event can be investigated and control measures taken to prevent a possibly deadly recurrence. There is no substitute for good see-and-avoid technique. Fly Safe! By the way…Just to see if you were really paying attention, we've included a short quiz at the end of these accounts.

NMAC, Numero Uno

A heavy on a local training mission performed a touch-and-go and was climbing to 2000 ft. The pilot requested direct to the home field VOR, and ATC directed a left turn and climb to 3000 ft. Seconds after being given clearance to the VOR, and while passing through 2500 ft, Departure gave the heavy's crew an advisory for traffic at 12 o'clock. The crew spotted the traffic on a reciprocal heading, stopped climbing, rolled right and missed the bug-smasher, a Cessna 172, by no more than 300 ft.

Why didn't approach radar pick up the traffic before a conflict occurred? It was tested immediately afterward and found to be functioning properly. Turns out that the location where the aircraft passed each other is one NM from the approach radar antenna, in an area where ground clutter causes reduced/intermittent primary and secondary radar returns, and that's why it was nearly impossible to get a consistent track of the bug-smasher.

The home field Class D airspace extends from the surface to 2500 ft AGL, with a five NM radius. The bug-smasher was flying directly over the field at 3000 ft AGL in Class E airspace. Even though the pilot wasn't in contact with the heavy's home field Approach or Tower, he was legal per FAA regulations. So, which FAA regulations were busted? Well, only one, really. FAA regs require pilots to "See-and-Avoid," which the heavy pilots were doing. And the bug-smasher pilot evidently *wasn't*, since he maintained altitude and heading throughout the event, oblivious to his near-rendezvous with the Grim Reaper. We were lucky (and good) this time.

The installation is situated in an area known for an abundance of traffic—commercial, civilian and military. MACA (midair collision avoidance) is a regular emphasis item at unit flight safety meetings. The unit also has an aggressive MACA Program that regularly reaches out to surround-

ing airfields to educate pilots on aircraft operations and traffic patterns at the base. Seeking a long-term fix for the congested airspace, the base is working several options to reduce the potential for NMACs, including an airspace "upgrade" that would require pilots to be in radio contact with base controllers and mandating transponder use for all aircraft in the vicinity of the airfield.

The heavy's crew stated in their HATR narrative that Departure controllers were directly responsible for preventing a midair collision. Well Done!

NMAC, Numero Dos

A flight of two helicopters reported inbound and eight miles north of the airfield at 500 ft, headed for a landing at Helipad G at the northern end of the airfield. The controller instructed the flight to report three miles northwest. The flight requested to report three miles *north* of the field. The controller then instructed the flight to report three miles *northeast* of the airfield for traffic spacing, which the flight then acknowledged. In the meantime, a fast-mover reported seven DME TACAN final for a full stop and was cleared to land Runway 02.

The flight of two choppers reported in at three miles *north* and requested an amendment to their landing site, from Helipad G to Intersection H, an intersection of two taxiways also at the north end of the airfield. The controller approved landing at Intersection H and directed the flight to maintain 500 ft *west* of the runway. The flight acknowledged all.

With the fast-mover now on short final, the local controller conducted a runway check and observed the flight of two helos overflying the numbers at the departure end of Runway 02. He immediately inquired of the flight if it was instructed to maintain 500 ft *west* of the runway, and received a "Flight on final approach" response. The controller then reminded the flight that they had been instructed to maintain 500 ft *west* of the runway. The flight apologized and acknowledged. All aircraft landed without incident.

The investigation resulting from the controller's HATR revealed that Lead for the two-ship misinterpreted the controller's instruction of maintaining "500 ft west." The pilot thought it constituted a 500 ft bubble shape when, in fact, "500 ft west" constituted a wall 500 ft horizontally from the edge of the runway, extending from the ground skyward.

All of this near-excitement did have some positive results. The helicopter squadron volunteered to host tours for the controllers and give them the operator's perspective, with a first-hand look at mission planning, execution and an orientation flight. Likewise, the controllers volunteered to host tours of their facilities and provide a look from the controller's point of view. Sounds like a good deal to us!

NMAC, Numero Tres

It was just a few minutes before midnight, local time, and mishap aircraft one (MA1) and the other four aircraft in his flight had just completed a night vision goggle airdrop at the nearby drop zone. They were recovering to the home field from the northwest and would execute a high-speed, downwind recovery to Runway 25. At the same time MA1 and the four aircraft he was leading were inbound, mishap aircraft two (MA2), a singleton, was flying a simulated, engine-out go-around, via a right closed pattern, using the same runway, Runway 25.

Before breath could give voice to expletive, MA1 and his No. 2 wingman found themselves nose-to-nose, nearly co-altitude, with MA2. If not for their evasive maneuvers, a midair collision would have occurred: MA2's pilots never saw MA1 or his wingmen. After taking a few minutes to collect themselves, all six aircraft landed safely and the series of events leading up to the NMAC was analyzed and reconstructed.

Based on the HATR that was filed, here's what the investigation revealed in "Safety Investigation Board Findings" style format:

- A Letter of Agreement between Approach and Tower required Approach to make an "aircraft inbound" call to Tower before aircraft closed within 15 NM of the runway. It also required a handoff to Tower before aircraft closed to within 10 NM.
- The time it took for MA1 and his flight to complete post-NVG airdrop checklist items and allow vision to re-adjust to existing nighttime light conditions took more time than a non-NVG airdrop mission. As a result, MA1 made later-than-normal contact with Approach.
- At the same time MA1 and flight were contacting Approach, Tower was giving approval to MA2 for the simulated, engine-out go-around, via a right, closed pattern.
- Just after Tower approved MA2's go-around, Approach called on landline with the "aircraft inbound" notification—MA1 and flight were now just five miles northwest of the base. By the time Approach directed MA1 to Tower frequency, MA1 and flight were on high speed downwind, just 3.5 NM from the runway and already one NM *inside* Class D airspace.
- Recognizing the potential conflict, Tower (twice) directed MA2 to turn left *immediately*.
- Had MA2 been on the *crosswind* leg, as Tower believed, the left turn may have been enough to

continued on next page

deconflict the aircraft. But MA2 had already begun the turn to downwind when Tower directed the left turn. As a result, the left turn placed MA2 head-to-head, and on collision course, with MA1's flight of five.

• MA2's clean configuration—gear up and no landing or taxi lights on—made it practically invisible to Tower and MA2's flight. Remember: It was nearly midnight.

• Inconsequential by themselves, this chain of events, when strung together, culminated in three large aircraft passing each other on reciprocal headings with less than 1000 ft of horizontal, and 200 ft of vertical separation.

As you would expect, this NMAC resulted in substantive amendments to home field procedures. One change now gives controlling agencies additional time to coordinate and hand off traffic. In addition, improved procedures are in place to ensure *positive* identification, control and communication with inbound aircraft. Considering what could have happened, lessons learned here were reasonably inexpensive. When all other measures, both low-tech and high-tech, failed to prevent this NMAC, good old see-and-avoid saved the day…

NMAC, Numero Quatro

Weather was night VFR, with the light of sunrise just starting to appear. A flight of four F-16s returning to Base X from a combat mission were making final preparations for landing when the two in the lead element found themselves beak-to-beak with a C-130 that had just taken off. Lead maneuvered aggressively to avoid the Herk, and it was only Lead's warning radio call that enabled his wingman to also take evasive action and avoid a NMAC. Miss distance between Lead and the C-130 was 200 ft, while the trail F-16 had a more spacious miss distance of nearly 300 ft.

The circumstances. The C-130 was outbound in "heavyweight" configuration. Because of steep climb gradients, it's not uncommon for some aircraft in heavyweight configuration to request, and be approved for, *opposite direction* departures. This C-130 was making an opposite direction departure. The SOF approved the C-130 crew's request for opposite direction departure and the aircraft was cleared to taxi and hold short of runway. Shortly after being told to expect a departure delay because of several arriving aircraft, Tower asked the crew if they could accept an immediate takeoff. The crew acknowledged it could and was advised of traffic—a four-ship of inbound F-16s—on 12 miles ILS final.

The four-ship of F-16s was returning from a night of FAC duty, with the four split into a pair of two-ship elements. The lead element was in two-mile trail with the trailing element eight miles behind, also in two-mile trail. Because of force protection measures, the lead element elected to be completely "lights out" until one NM from the field. On the other hand, the trail element turned their landing lights on nearly 10 NM from the field.

What Tower *didn't* realize was that while the C-130 had been given clearance, it had to taxi gently over the arresting cables/barrier to prevent causing damage. This resulted in the passage of nearly 60 seconds between takeoff approval and actual takeoff roll. All the while, the four-ship of F-16s was speeding ever closer to Base X. Once airborne, and aware of the inbound F-16s, the C-130 pilot and copilot spotted landing lights and believed they had visual on the closest traffic. In fact, they were seeing landing lights from the *trail* element of F-16s. (Remember: The lead element elected to be lights out until just one NM from the field.)

At nearly the last moment, the C-130 Nav called traffic with "lights out," witnessed the traffic turning to avoid and watched it pass low and under their C-130. His pilot and copilot never saw the two F-16s. If not for the first rays of light from a rising sun, the Lead F-16 wouldn't have seen the C-130's silhouette, and several lives, along with three USAF aircraft, would have been lost.

Contributing factors? Everyone involved in air traffic control operations was fatigued from more than two months of non-stop, around-the-clock, combat operations, including nearly three straight weeks of 12-hour surge shifts. Doing their best to "make it work" in support of ongoing combat operations, a series of small, seemingly insignificant communication errors and incorrect assumptions cascaded into this near-catastrophic sequence of events. Hopefully, the crosstell generated by this event—underscoring the critical importance of using proper phraseology, required coordination procedures, separation standards and flight progress strip marking for opposite direction departures—made it to all personnel involved in ATC operations. If you'd like to know more about this HATR, you may contact MSgt Kevin Elliott, HQ AFSC/SEFF, at DSN 263-2034. Ask to speak with him about the 29 May 99 NMAC.

Now, for the quiz. The Ops Topics theme for this month has been:

(A) How I Learned To Stop Worrying And Love The Occasional NMAC.

(B) An NMAC is something that only happens to the other *guy.*

(C) In today's high-tech world, the probability of an NMAC is insignificant.

(D) The USAF HATR Program, and filing an AF Form 651, Hazardous Air Traffic Report, really CAN save the lives of my bubbas and me.

The correct answer? Are you kidding? File a HATR, save a life!

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

MAINTENANCE MATTERS PRESENTS…*Complacency Bites, Part Two*

Ghost In The Machine, Part 1

The transport aircraft was making the second of two planned, intermediate fueling stops on its way to an overnight stay at Base X. The stop was *supposed* to be just a gas-and-go. Transient Alert dispatched a Follow Me vehicle to lead the aircraft to parking and, as they neared the designated parking spot, the Follow Me driver stopped his vehicle 75 feet in front, and offset from the centerline, of the aircraft.

The driver parked, exited the Follow Me and marshalled the aircraft into its parking spot without incident. That is, until not-too-many-moments-later his Follow Me vehicle rolled into the nose of the aircraft. Damage to the non-Air Force vehicle? About $5400. Damage to the Air Force aerospace vehicle? Nearly $600 thousand.

Ever depart your vehicle for "just a minute" so you can "run inside" for something? Sure, we all have. But next time you do have to exit your vehicle for "just a minute" so you can "run inside" for something, be safe. Kill the motor, put it in "Park" and set the brake. Depending on where you are, you may need to use chocks, too. Don't set yourself up to be a chump.

GHOST IN THE MACHINE, PART 2

Primary purpose of the A-10 two-ship mission was to get an instrument check ride for pilot No. 1, with pilot No. 2, the mishap pilot (MP), acting as examiner. The flight crews' brief, step and walk arounds were routine. After strapping into their respective jets and starting to get really serious with preflight preparations, the MP started his jet's No. 1 engine, followed by No. 2, which stabilized briefly at idle before flaming out altogether. The MP shut down the engines, aircraft systems and APU, turned the aircraft back over to the Crew Chief and stepped to the spare.

Propulsion troops troubleshooting the No. 2 engine no-start problem duplicated the MP's problem and experienced three unsuccessful starts. Not only was the motor not starting; there was no interturbine temperature, no fuel flow and the No. 2 engine fuel pressure light remained illuminated. Fuels technicians were called in to assist and ultimately determined that the No. 2 engine fuel cross-feed valve motor connector plug was crossed with the No. 2 engine fuel shutoff valve motor connector plug. "Uncrossing" the two plugs fixed the engine no-start problem.

Recently, there had been a locally directed OTI on the fuel shutoff valves for the unit's aircraft. Look back revealed that on this particular Warthog, both shutoff valves had checked bad. Ballistic foam was removed FOM to replace the shutoff valves and, once the valves had been R&R'd, were tested and op checked good. With a green light to put the aircraft back together, the shutoff valve connector plugs were disconnected once again in order to reinstall the ballistic foam…

Here's a question worth asking yourself next time you're disconnecting and reconnecting equipment connector plugs: "Before I sign off this write-up, is it most critical that I ensure the equipment/system works as advertised after I hook up the connector plug(s) the first time or the last time?"

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.

Lieutenant Colonel Jeffry F. Smith
28th Bomb Wing
Ellsworth AFB, South Dakota

On March 15, 2000, while leading a routine two-ship night training mission en route to the Utah Test and Training Range at 25,000 feet, Tiger 01 entered an uncommanded right-hand turn. The pilot disconnected the autopilot and attempted to turn the aircraft to the left. When he saw that his control stick was frozen in position, he transferred aircraft control to Lt Col Smith, the instructor pilot. Finding that his control stick was likewise locked in place, with no associated loss of hydraulic or electrical systems, Lt Col Smith directed the pilot to perform emergency BOLDFACE procedures to disconnect the sticks, thereby separating the two control sticks to operate independently. With the sticks disconnected, Lt Col Smith's control stick moved freely again, but only with very marginal effect on the aircraft's flight controls. During the transfer of aircraft control and the subsequent disconnect of the control sticks, Tiger 01 lost approximately 800 feet of altitude before aircraft control was regained. Lt Col Smith declared an in-flight emergency with ARTCC and continued a slow descent to regain more control over the aircraft. There was a choice between recovering to Hill AFB, about 150 miles away, or to Ellsworth AFB, nearly 300 miles away. The emergency procedures checklist directed the crew to land as soon as possible. Given the heavy fuel load and the need to reduce weight to regain more control authority, the crew elected to return to Ellsworth while dumping fuel. Lt Col Smith continued to fly the aircraft from the right seat with the only stick available for control of flight. Flight with control sticks disconnected had been attempted only once before during initial B-1B flight tests by qualified test pilots, and has never been attempted since. During the flight test, the test pilots quickly concluded that the aircraft was so difficult to control that they reconnected the sticks and formally recommended no further testing take place with the control sticks disconnected. During the controllability check, Lt Col Smith prepared to execute the first-ever landing of a B-1B with sticks disconnected. After a successful check, Lt Col Smith accomplished one practice approach, then landed the aircraft flawlessly from a subsequent approach. The superior airmanship, professionalism and crew coordination exhibited throughout this never-before-seen emergency in the B-1B directly resulted in the safe recovery of an irreplaceable $280 million flying asset and the lives of four crewmembers.

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Captain Kevin A. Huyck
67 FS/DOW
Kadena AB, Japan

Captain Huyck was flying a Basic Fighter Maneuvers Instructor Pilot Upgrade (IPUG) sortie with another F-15C stationed at Kadena AB, Japan. He was flying in the wing position, performing instructor duties for the other pilot. Weather at takeoff was 1000′ overcast and solid up to 12,000′. Visibility was 4 NM. In flight, at 1135L, during the setup of their first engagement, Captain Huyck noticed the indications for left generator failure. He initiated a "knock-it-off" and applied Dash-One checklist procedures in an attempt to get the generator back on line. The generator remained out, so he reduced his electrical load by turning off his Tactical Electronic Warfare Set and radar. At this point, the two pilots had already orchestrated a rejoin, performed a battle damage check and began their return to base, about 67 miles away. Having lost only one generator, Captain Huyck still retained all his communication and navigation functions. However, just in case this situation deteriorated, he remained in the wing position for the RTB through the weather. Just prior to descending into the weather, the landing gear warning horn began to beep, both inlet ramps slammed up and the jet markedly decelerated. Also, every light on his caution panel lit up and his bit panel on the left console went blank. These are expected indications for a double generator failure. With this failure, his #1 radio was operating intermittently and #2 was out, so he had no means to communicate. He immediately pulled forward to line abreast, while rocking his wings to get the attention of the other pilot, who was about to enter the weather. The other pilot leveled off above the weather while Captain Huyck silenced the warning horn, reset his CAS and locked his inlets in the up position. He then passed visual signals for "I must land immediately," "I must land on your wing" and transmission, reception and electrical failure. With double generator failure, the remaining equipment to aviate, navigate and communicate is limited to the main ADI, the standby altimeter and airspeed indicators, the HSI and the #1 radio. Since his #1 radio was intermittent, Captain Huyck was faced with a NORDO recovery, without adequate navigation equipment. Added to this, with double generator failure, only one boost pump is providing fuel to both engines and the Heads-Up display is inoperative. This is as serious an EP as you can get in the F-15C. The other pilot led Captain Huyck through the weather in the fingertip position for the remaining RTB, approach, and into the flair, where Captain Huyck then executed a flawless landing. The teamwork and calm professionalism of Captain Huyck kept many potential hazards (weather, multiple emergencies, NORDO) from building to a catastrophic end.

Imagery by Naval Research Laboratory
Photo Illustration by Dan Harman