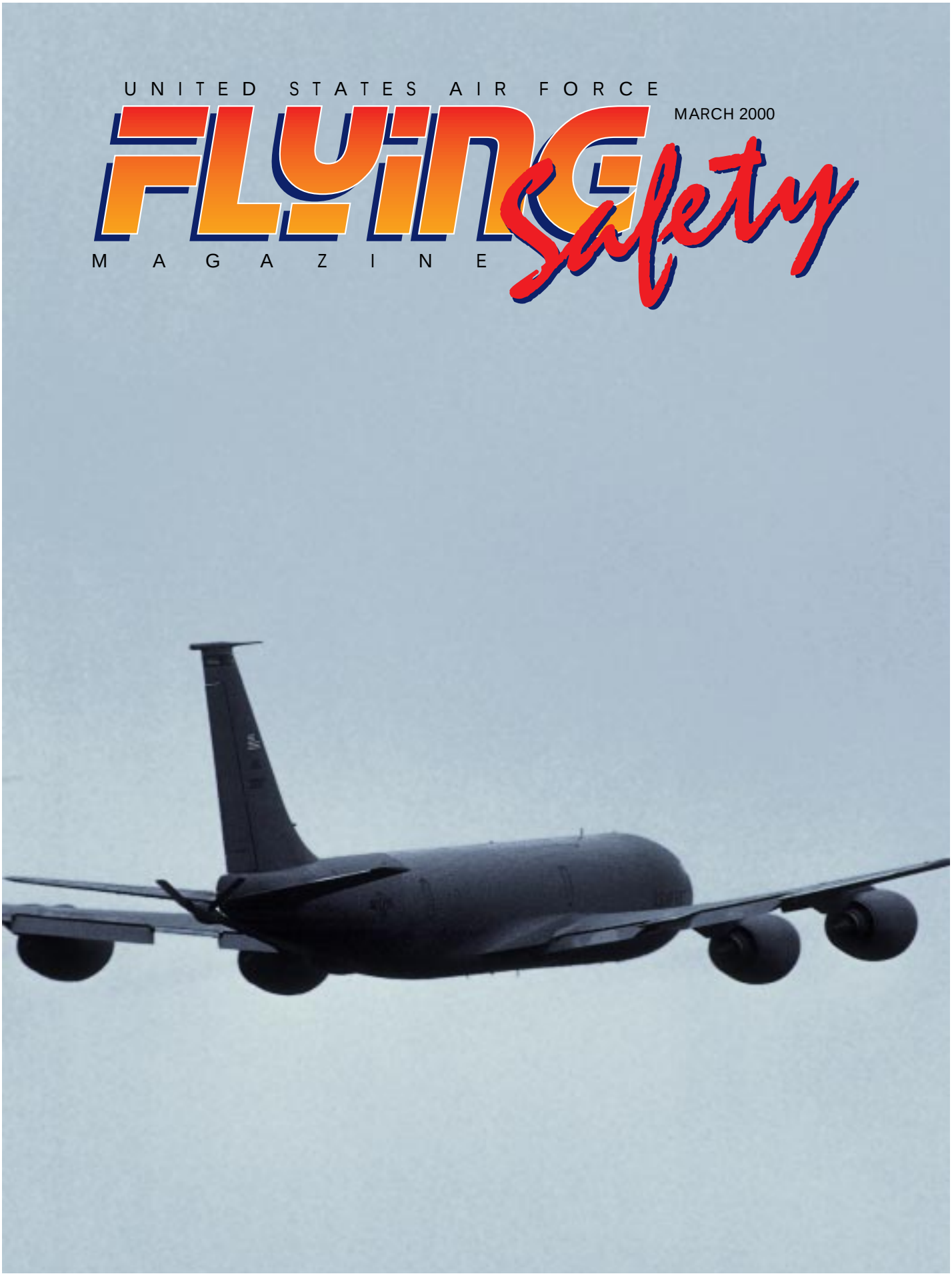
UNITED STATES AIR FORCE

FLYING Safety

MAGAZINE

MARCH 2000



UNITED STATES AIR FORCE

FLYING Safety MAGAZINE

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AHOY, MATIES!

Courtesy ASRS *Callback* #238, Apr 99
NASA's Aviation Safety Reporting System

The Captain of a DeHaviland Dash 8 on approach into an East Coast airport reports a different sort of "Conditional Clearance."

We had briefed for the ILS approach. We were tracking inbound on the localizer and Approach Control kept us high (above glideslope) before clearance for the approach. I elected to fly the approach manually to facilitate intercepting the glideslope from above. We contacted the Tower at the Final Approach Fix (FAF). Not long after the FAF, I heard the Tower issue a caution to the aircraft ahead of us that there was a ship in the channel with a height of 150 ft. The Tower Controller then issued the same "Caution, ship in channel, 150 ft in height" to us. At this point we were over halfway between the FAF and the runway. While concentrating on flying the approach, in the back of my mind I was trying to consider the significance of the caution. We continued the approach and made contact with the approach lights just above the normal decision altitude (DA) (218 ft). After landing...we looked over the approach chart and realized the "conditional DA" (359 ft) for tall vessels may have applied. I did not know what height constitutes a "tall vessel." It is not written anywhere that I could find. I asked Clearance Delivery and they didn't know, but checked and told us it was 85 ft or higher. Oops!

We were clearly remiss in not catching the conditional DA during the briefing, but there were several issues that "set the trap" for us. First, there was no mention of ships in the channel until we were well inside the FAF. Second, the Controller did not use the terminology "tall vessels," which gave us an ambiguous caution message.

The reporter recommends that ATC use the phraseology, "Tall vessels in approach area," which is the wording found on both NOS and commercial approach plates. This terminology would likely have triggered recognition among the flight crew that the higher, "conditional" decision altitude was required. ✈

THE PSYCHOLOGIC
Profiling The Mind

FREDERICK V. MALMSTROM, Ph.D., CPE
USAF Academy, CO

The tragic crash of EgyptAir Flight 990 on 31 October 1999 has led both experts and amateurs to speculate whether the copilot intentionally took his own life and those of his 216 unwilling passengers. Some government officials counter that the suicide possibility is so preposterous—so politically incorrect—the question shouldn't even be considered. Well then, *is* it possible? Could such an event have been predicted? And, if it could, then who's to blame? A long, thoughtful article by Christopher Drew in the 21 November 1999 New York *Times* reports that some experts strongly recommend psychological testing to identify potentially suicidal pilots. Professionally, I have my doubts about this fix, and I'll explain why later on.

In addition to my Air Force flying career, I'm also a retired state prison psychologist. In my second life as a shrink, it was one of my many unpleasant duties to perform "psychological autopsies" on inmate suicides. Unlike garden variety medical autopsies where the medical examiner has the body physically present, the clinical psychologist has the bewildering task of piecing together information from the deceased person's criminal records, medical and mental health files, friends and enemies, firsthand knowledge and rumors. It's a kind of FBI Profiler exercise in reverse. What the psychologist is doing is attempting to recreate what was going through the victim's mind at the moment he launched himself into eternity. Talk about an impossible task. Mind-reading is a lost art—if ever it existed—but imagine reading the mind of a dead person!

Psychological Autopsies are Routine

In cases of questionable deaths, the Federal Bureau of Prisons, the FBI and the FAA do them all the time. The psychological autopsies I performed involved miles of legwork and hours of thought. It frequently took me days and even weeks to recreate the mind of the deceased inmate for even the most "routine" suicide cases, if you consider suicide routine. Even so, my end result contained lots of educated and, I'd like to think, professional guesswork. Alas, it was also never difficult to find another expert mental health professional who would disagree with my opinions. Fortunately, the opinions expressed in a Federal psychological autopsy are *not* intended as CYA (i.e., Cover-Your-Agency) documents. They are, like flying safety investigations, fact-finding, privileged and confidential information, and reputedly immune from litigation.

My assigned tasks of performing prison psychological autopsies were a whole lot easier than those tasks which confront the FBI and the FAA. After all, I had at my fingertips both criminal and mental health files, and the immediate friends and enemies of the dead man. I also had results of years of psychological tests. Most of our psychological screening tests are designed for special clinical populations such as the mentally retarded or psychiatric and prison inmates. That is, these populations are presumed to be either crazy or stupid. Commercial and military pilots are definitely not the people these tests were created for.

Pitfalls of the Psychological Autopsy

The NTSB's job of reconstructing the psy-

AL AUTOPSY: Of A Dead Copilot

chological facets of the EgyptAir 990 flight won't be as easy as mine was. Deceased pilots rarely have criminal or psychiatric records. Their medical files could exist in many countries and under assumed names. (I knew crewmembers who, for obvious reasons, had their venereal diseases, sinus problems, and migraines treated confidentially by private physicians. Back in the 1960s before motherhood was officially permitted, I knew servicewomen who had private, out-of-country abortions.) Official Class I medical files make slight reference to a pilot's mental health, frequently stating "WNL" (within normal limits). In the medical profession, we often joked that WNL stood for "we never looked."

Reconstructing a Murderer's Mind

I'll share with you one actual psychological autopsy I performed. Let's call this guy Smith. Smith was a Good Ol' Boy who had had a very unhappy marriage, a history of alcohol abuse, and a career which had never gone anywhere. He'd accumulated a tiresomely long rap sheet of minor offenses such as domestic abuse, public intoxication, dynamiting fish, etc., but nothing really big league. Then one glorious October day he calmly finished off a quart of whiskey, wrote down an unintelligible list of rambling thoughts, loaded up his shotgun, and killed his wife and infant daughter point-blank. Then Smith turned the gun on himself. This time he wasn't so accurate, for he only succeeded in blasting off the right side of his face. Following the legal wisdom of the day, my state took a whole year to patch up Smith with publicly funded plastic surgery and physical therapy. Then the state tried and convicted him of first-degree murder and sentenced him to death. The first and only time I saw Smith alive, he was in transit from county jail to Death Row. Although paralyzed on the left side of his body from his first failed suicide attempt, he cheerfully insisted he'd changed his mind and was now not suicidal. Our psychiatric nurse noted that his mental status was "WNL," so our overworked contract psychiatrist placed him in a locked ward on 15-minute suicide observation. Smith's mental status certainly *was* quite alert and WNL, because despite his physical disabilities, he managed to hang himself from the fire sprinkler with his hospital robe within that 15-minute gap. This was obviously a cool and well-planned, deliberate act of self-destruction. My psychological autopsy revealed many bureaucratic oversights in Smith's care. For instance, the county jail didn't tell us that Smith had attempted suicide twice in the month before we got him. Smith wanted to die. Smith didn't want his family to suffer. Smith was *depressed.*

Depression is Dangerous Stuff

Tragically, as with the case of Smith, suicide doesn't always end in killing just yourself. In far more cases than are reported on the evening news, *suicide victims often like to take other people with them*. In my years of working in the prison mental wards, I personally knew at least three inmates—all convicted of murder—who had killed their victims and then turned the gun unsuccessfully on themselves. Only in these instances, two of my patients had inadvertently shot

continued on next page

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out their eyes and the other man gave himself an unscheduled lobotomy. Does that make you wonder how many fatal automobile or aviation accidents are de facto suicides? Ah, that's a great research topic for at least a half-dozen doctoral dissertations.

Enter the Profiler

What kind of guys were my suicidal murderers? As a curious follower of the FBI-style personality profiling process, I can tell you they were all *nice* guys—really. I personally liked and became friends with each of them. I found absolutely nothing in these men's histories which indicated they had the typical "criminal personality." There were no tipoffs like the usual juvenile records, sex offenses, torturing animals, or even chronic drug and alcohol abuse. The only common threads they shared was that all had suffered from major depression. Depression nearly always rears its head after the patient has suffered through failed personal and professional relationships. Depression is nearly always the major factor in suicide-murder. (Check this out against the so-called disgruntled postal worker syndrome.) Suicide is their only way out. Chillingly, I also found that once my patients had made up their minds to commit suicide, a strange calm and resolution settled over them. At that critical point they denied that they were any longer depressed. The only problem remaining was how to do it.

I won't comment on a person's right to suicide, but I do have strong opinions on his right to hand innocent people a one-way ticket to the hereafter.

Suicide is Difficult to Predict

Clinical psychologists get hundreds of false alarms. I've placed hundreds of patients on and off suicide watch, and most of them were fakers and malingerers. I can easily build a psychological profile of the typical suicide attempter, but the odds of predicting the *successful* suicide are only somewhat better than my predicting the next winner of the state lottery. But even if I can't predict suicide, I can predict *depression* a lot more accurately—and so can your flight surgeon and his or her mental health team. Any flyer with major family, financial, or professional problems needs to be checked out ASAP.

A Pilot with Untreated Major Depression Has No Business Flying

Suicide is one of those real possibilities which accompany major depression, and many suicidal individuals are coolly capable of taking victims with them. It makes little difference whether that person is a pilot or postal worker, only the pilot may have the responsibility for the safety of hundreds of lives. When depressed, this guy is a clear and present danger to both self and others.

Will There Be a Flight 990 Psychological Autopsy?

You betcha. It's a given the FBI and / or the FAA official psychological autopsy on the EgyptAir 990 copilot is well in progress. Will this autopsy report be open to the public? Probably not in all its details, as some findings will be confidential, and questions will always remain.

As I write this article from my armchair, I have no way of concluding whether this copilot had suicidal intent on his mind, but the FAA or the FBI still has a clear duty to attempt this reconstruction of the mind of a dead pilot. This entire detective profiling process will take tedious months of crossing international borders, interviewing associates, checking out leads and dead ends, and going over piles and piles and piles of paperwork. And their end result will be only a professional opinion, for clinical psychology is at best a sloppy science. Regardless of the facts, the usual unbelievers will quickly dismiss the official psychological autopsy findings. After all, there are people who believe Elvis is still alive and well in Kalamazoo. ✈

LT GEN GORDON A. BLAKE
AIRCRAFT SAVE AWARD
1st and 2nd Quarters, CY 99

SSgt Ronald L. Davis (RAPCON, North Approach Controller), 60th Operations Support Squadron, Travis AFB, CA.

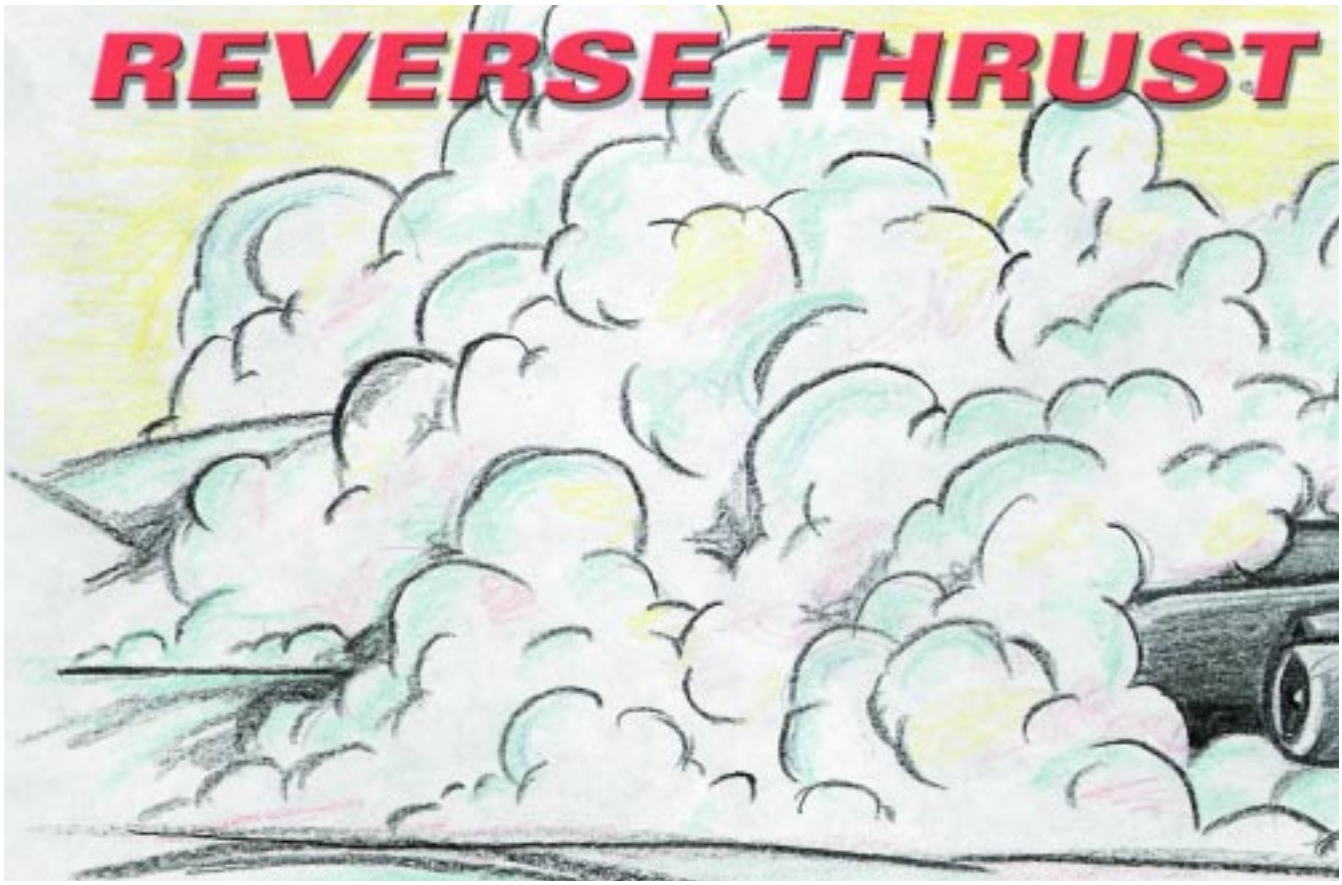
During an IMC day at Travis AFB, TSgt Davis recognized that the second element of a flight of three MARSA (military authority assumes responsibility for separation of aircraft) KC-10s was on a collision course with lead. His immediate call to separate them vertically resolved a potentially disastrous situation, both for aircrew and aircraft.

TSgt Larry K. Williams (RAPCON, Approach Controller), and SSgt Roy A. Wanner (RAPCON, Coordinator), 31st Operations Support Squadron, Aviano AB, Italy.

During Day 24 of Operation ALLIED FORCE, four NATO fighters were returning to Aviano from combat missions over Yugoslavia. Shortly before their recovery, an EA-6B Prowler was forced to engage the arresting cable, closing all runway operations. Since weather was IMC, the four aircraft were directed to hold at the initial approach fix. After 10 minutes in holding, the pilots of aircraft 1 and 4 asked for divert clearances to Ghedi, Italy, because of fuel concerns. As aircraft 2 and 3 remained in holding, SSgt Wanner, the coordinator, recognized that aircraft 2 was extending his outbound leg of the holding pattern in an area with an 11,000 ft MVA (minimum vectoring altitude). He immediately notified TSgt Williams, the approach controller, who issued a "Low Altitude Alert," and aircraft 2 re-entered holding uneventfully. Within a few minutes, aircraft 3 deviated from *its* holding pattern in close proximity to a mountain in an area with an 11,000 ft MVA and again, TSgt Williams immediately issued a "Low Altitude Alert." The runway closure, IMC conditions, and several divert aircraft in the terminal airspace made this an extremely complex situation. TSgt Williams' and SSgt Wanner's timely actions likely averted loss of life and valuable combat assets.

TSgt William Christie (Local, Tower), 354th Operations Support Squadron, Eielson AFB, AK.

While working as a local controller in Eielson's tower, TSgt Christie told an A-10 pilot to report his gear down. When the pilot reported gear down, he cleared the aircraft to land. As the aircraft turned to base on short final, TSgt Christie recognized the gear was still up and sent the aircraft around. TSgt Christie's attention to detail prevented a hazardous situation and possibly saved the pilot's life. ✈



MAJ BILL WALKOWIAK
HQ AFSC/SEFF

A few years ago I experienced an incident using thrust reversers in the great white north of Thule AB, Greenland. Nothing happened to us and it wasn't a mishap so it never got any attention. More on that later.

Here at the Safety Center there is a lot of opportunity to study other aircraft and systems besides the one you are familiar with and I have found that there is a lot of differing information on the use of reverse thrust. Even though many large USAF aircraft have them, most flight manuals offer very little advice on thrust reverser operations. So, here are a few pointers from an almost-crusty C-135 pilot on the use of reverse thrust.

Let me say first that nothing I say here takes precedence over the operations manuals (Dash-1) or any other command guidance. My experience has been on the C-135 and C-18 airframes.

Thrust reversers haven't been around very long in the history of aviation. For the first 50 years airplanes were relatively light and they had big propellers out front which can add a lot of drag (or negative thrust) to help with stopping on the ground. With the emergence of large jet-powered aircraft in the late 1950s and early 1960s the problem of stopping was a serious engineering challenge. Engineers developed the thrust reverser systems of sliding sleeves and clamshell doors in the 1950s.

The first two major engines to use this technology were the Pratt & Whitney JT-3 (Military J57) and the General Electric CJ805 (derived from the Military J79). The basic idea is to route the primary jet and fan section bypass air through a series of chutes and doors to propel it forward. These devices were complicated "Rube Goldberg" devices that had a lot of reliability and maintainability problems.

During my 15 years flying with the JT-3C/D engine, nothing failed more often than thrust reversers except for the now-defunct water injection system. Still, when properly greased and exercised, these reverser systems add to safety and definitely save on brake system wear.

Reversing in Snow Conditions

There I was... We were taking the SATCOM C-135E test-bed up to Thule, Greenland for a week of on-the-ground testing. I hadn't landed that far north before but

USAF Illustration by SSgt Robert Guere, Edwards AFB

did spend four winters flying up at Loring AFB, ME. I was comfortable with my cold weather operating procedures.

We took off on Feb. 8 and flew northeast. We passed into Canada and then coasted out with Moncton Center, near Frobisher Bay.

As night fell and we approached about 67 degrees north latitude we started to see the Aurora Borealis. It was spectacular! A blue/green shimmering curtain, and we flew right underneath it.

After passing the northern lights, we still had over an hour to fly up to Thule. The compass is messed up that far north so we went into "Grid" navigation and even flew a special instrument approach in grid. We knew all of this and planned extensively beforehand.

I was in the left seat and it would be my landing. It was a crisp, clear night. The outside air temperature was minus 40 degrees C. Weird things happen when it's that cold, like your groundspeed and rates of descent are less, due to the higher air density.

The winds were light and variable and the runway was RCR 7 with loose snow. We calculated the landing data and determined we had adequate stopping capability. The ILS approach was well flown and I touched down on speed about 1100 feet from the threshold. As the nosewheel lowered to the runway, the landing light illuminated the white runway beneath me. As the nose gear touched, I brought up the speedbrakes and the reverse levers to reverse idle. The Flight Engineer called "Four lights," signifying that all four sets of interlocks should have released and I brought the reversers up into full reverse.

About a second later, the lights and nose of the airplane were enveloped in a huge white cloud of blowing snow. I was "driving blind" in a 100-knot whiteout on a slick runway! So I used one of my famous techniques.

The general rule is this: "If you do something which is immediately followed by a dangerous, scary, or otherwise bad thing, then do the opposite thing from what you just did!" So I quickly brought the levers back down. We drove through the snow cloud in another couple of seconds and I completed the full stop.

The C-135 Dash-1 doesn't talk about landing on snowy runways with reversers. It does explain how you lose crosswind capability with reversers. As a matter of fact, you

continued on next page

The C-135 Dash-1 doesn't talk about landing on snowy runways with reversers. It does explain how you lose crosswind capability with reversers.

If your Dash-1 or command prohibits backing up, then don't do it. If you don't have specific procedures for backing your aircraft then you shouldn't do it unless there is an emergency.

must reduce your maximum crosswind on the ground by six knots with two reversers and 12 knots with four reversers due to the possibility of asymmetric thrust. I guess the caution there is to avoid the reversers if there is loose snow and your engines are slung low to the ground. The C-5 and C-141 Dash-1s have a caution to that effect:

Caution

Care must be exercised in the use of thrust reversers during loose snow or ice fog conditions to avoid a reduction of visibility due to the redirected airflow.
C-141B Dash-1, Page 7-11

Backing the Aircraft

Most aircraft are not authorized to back up with reversers. Here is why you shouldn't do it.

First, it is very hard to steer an aircraft backwards. Most large jets were not designed for backing up. If you try to stop a reversing aircraft with wheel brakes, Newton's Second Law predicts you have a good chance of tipping on your tail.

Also, slow speed reverse thrust operations greatly increase the chance of foreign object damage as the aircraft literally sweeps the ground in front of it and then sucks the debris into the intake.

Finally, you cannot usually clear behind you very well from the cockpit. So you would need a spotter or marshaller.

If your Dash-1 or command prohibits backing up, then don't do it. If you don't have specific procedures for backing your aircraft then you shouldn't do it unless there is an emergency.

What kind of emergency? I would say a BIG one. In one of my previous units there was a crew that was TDY to a South American country when a civil war broke out. After some close calls, they got everyone back to the plane and took off. I understand they filed their flight plan in-flight! If that crew was nosed-in to a terminal, I expect they would have chanced a reverse thrust backup to get out of the gunfire.

If you do attempt this, make sure the area in front of the jet is clean of possible FOD and use the minimum thrust necessary. Have a spotter to marshal you on headset and make sure the spotter has some eye protection because there will be lots of stuff blowing up around him/her.

Also, stop your reverse taxi with forward thrust instead of brakes to avoid tipping on your tail. I would also suggest you write it up in the forms and have a FOD inspection done on your engines as soon as possible. The reason I am writing this is not to encourage you to do this but to make sure that if there is ever a necessity for you to do it, that you are at least armed with the knowledge to do it as safely as possible.

Thrust Reverser Failures

Almost ten years ago now, there was a

Photo Courtesy of the Author

four-engine transport plane landing mishap where the engine ran away (overspeed). The crew wasn't aware of the malfunction because the engines were in a high rpm reverse-thrust configuration when the failure occurred. The pilot came out of reverse thrust and returned to forward thrust with the engine still overspeeding, which caused a large asymmetric thrust condition. The pilot could not remain on the runway and substantial damage occurred.

The point here is that with a suspected runaway or uncontrollable thrust situation, it is advisable to immediately shut down the engine on the runway to avoid the uncontrollable asymmetric thrust. Another technique would be to go down to reverse idle before returning to forward thrust. Most aircraft allow operations down to taxi speed at reverse idle.

Failures in flight can be catastrophic. The C-5 crash in 1990 is only one example. There have been other, more recent examples in the civilian jet fleet. Most flight manuals have procedures for unsafe in-flight reverser deployments. The goal in all of them is to first reduce the asymmetry and second, to safely restore forward thrust.

Pinning Them Out

If you ever have a thrust reverser malfunction while deployed or there is no maintenance available, you may be able to continue your mission. If the crew chief is trained to "pin out" the offending reverser, it is safe to proceed knowing that it is physically incapable of moving to the reverse thrust position.

One caution here is to ensure the crew chief pins the opposite engine's symmetric reverser to avoid the possibility of inadvertent asymmetric thrust. Also, remember that you won't be able to use the option of using "two in reverse" options for takeoff data planning if you already have two pinned out.

Overall, a Safe System

The USAF Safety Center database has 38 reverse-thrust mishaps from 1982 through 1995. Except for the C-5 Class A, they were all Class Cs or High Accident Potential mishaps.

With winter upon us, it's time to take a look at this critical but often overlooked system. We have had a good record of safety with reverse thrust but it's important to remember that the potential for mishap is still high and it's easy to let down after touchdown.

Remember that you are not done with the aircraft until you are safely shut down in the chocks. ~~Fly~~ Land safe! ✈

The USAF Safety Center database has 38 reverse thrust mishaps from 1982 through 1995.

Low-Level Flight

LT COL HANS SWOBODA
German Air Force

The B-1 Bomber did have a lot of problems, but now it is a most effective part of the USAF arsenal. As the first German ever to do so, Air Force Officer Hans Juergen Swoboda flew a training mission across Texas.

There, where usually half of all Boeing B-1B Bombers are parked, you see gaps. Too strong winds make it too risky to try a landing today at Dyess AFB, situated in the heart of Texas. The aircraft have to divert and are awaiting a weather improvement.

This is also true for my introduction flight on America's swept-wing bomber. An exchange job at the Air Force Safety Center and 12 years of experience in Tornado flying operations are ideal prerequisites.

Shane Stevenson, one of about 30 instructor pilots, greets me with "The first German in a cockpit of a B-1B."

The first step leads us into the flight simulator building. For me as a B-1B novice, this is exactly the right surrounding to familiarize myself with the cockpit as well as the flying characteristics of this aircraft, called the "Bone" by its pilots. Not being used to vertical instruments and a lot of other displays, my concentration diverts from usual flying habits during the first landing approach. "Full flaps" is Shane's sole comment. But even that is not sufficient—I screw up the landing and we have to go around. "Not bad for the first time," a smiling critic announces at my side. Gladly, I'm not one of his real students. They wouldn't be laughing after this mishap.

The introduction in the simulator lasts over one hour, followed by a couple of briefings concerning safety instructions and operational aspects as well as a thorough introduction in the features of the ejection seat.

Prepared like that, the real flight awaits me the next day. Fortunately, only five hours are planned for my flight. "My first flight lasted over 11 hours," David Cleary (called Roy), our mission commander, tries to make me feel comfortable. On board are also Shane Stevenson and Robert Thompson (Rob).

I'm responsible for getting the weather. No problem, since the formats for a forecast are an international matter. A short glance is sufficient to see that the winds are dying down. Harder though for me is to understand abbreviations like "D15 is PECP A" and "ACAL is on the left side" during the flight preparation. That simply produces question marks. Two hours prior to takeoff, the last preparations begin.

Carrying helmet and necessary flying gear, we receive the latest flight documents. Weather and flight briefings are accomplished, now a quick lunch pack for the late hunger and up we go to the aircraft.

Behind the nose gear we crawl via a ladder into the cockpit of the "alien with an attitude." I'm getting the left rear seat, which is normally occupied by the Defensive Systems Operator (DSO). Helmet, oxygen mask, leg and arm restraints and ten locking devices build a unit of man and ACES II ejection seat. Over my head is the ejectable escape hatch. Forward visibility is degraded by hundreds of switches, levers and instruments.

Good Turning Performance Also At Low-Level

The window at my left side must have been designed for very small persons. "We

With The "BONE"

call it the day and night indicator," Rob comments. To look outside is nearly impossible. Rob is sitting in the right rear. As an Offensive Systems Operator (OSO), he is responsible for navigation and weapon employment. He checks Inertial Navigator, Radar and numerous other systems. In contrast to his displays, mine are all blank. They have to be—everything's Top Secret.

After all systems run properly we taxi to the runway. "Cleared to take off," throttles full forward and lift off after exactly 20 seconds into the morning sky. A tremendous acceleration considering the weight of the 140-ton monster. It takes exactly the same amount of time to retract the landing gear with its ten wheels. After that, it goes up expeditiously to FL220. The four General Electric F101 Turbofans are using more fuel during that phase of flight than a Tornado can carry with two external tanks. The cockpit is pressurized and we can take off our oxygen masks. "Co, O..." is announced via intercom and everybody is waiting for my answer: "D." Strict radio discipline is mandatory, otherwise a hell of a confusion may result among the flight crew.

"Three pins, ARM, MAN," Roy is demanding. The signal to safe the ejection seat. The chance for me to go into the front cockpit has come. The copilot's seat is already empty. An outstanding acrobatic performance is necessary to take the seat in the front cockpit since no switches, the stick or any lever may be touched. Oxygen mask, leg- and arm restraints and again ten locks are fastened. The seat can be set hot again.

Out front, visibility is outstanding. Only to the back, visibility is nearly nonexistent; even the little rear view mirror doesn't help much. Therefore it's the task for the DSO to observe this portion during an operational mission. Depending on arising necessity, he can reprogram his computers during the flight to obtain the newest information concerning enemy radar and missile threats. It seems that as far as this capability is concerned, previously encountered problems have been overcome in the meantime. A "bug out" is the last chance, Rob explains. At low-level, the B-1 can fly fairly long at high speed. Holding Mach 1.2 on the deck, you lose any enemy very quickly.

And that's exactly where we are heading now. After a flying time of 90 minutes, all systems are thoroughly checked again and the necessary adjustments for an automatic terrain-following flight are made. The computer guides the jet at an initial dive angle of eight degrees and then ten degrees towards the ground. The descent is terminated at 1000 feet—for today. Otherwise the bomber can go down to 200 feet in the automatic TF mode.

The "Bone" thunders along the Texas landscape at nearly 1000 Km/hr. Following the border to Mexico, 2000 meter high mountains alternate with very flat countryside. In contrast to jets like the Tornado or the F-4 Phantom, it's fairly quiet in the cockpit of the B-1 and not very turbulent. That's achieved by the SMCS (Structural Mode Control System). Existing stress on the airplane is counteracted by use of those little duck wings in the nose area of the B-1. It not only increases comfort level but also keeps the stress on the plane at an acceptable level. Despite the huge wingspan and the total weight, the B-1 is fairly maneuverable. She's reacting just a little slower than a fighter-bomber or fighter. Limited to 3 G, she has a corresponding turn radius. Higher G-loads are too much for the structure of the jet.

The four engines consume nearly 340 liters of fuel per minute. At 280 meters per second and fully swept wings, the jet approaches its simulated target, a road intersection. Although equipped with a fixed radar antenna, the B-1B gets usable

continued on next page

target pictures at a distance of 180 km. Best pictures / resolution is achieved at a distance of approximately 40 km.

This gives the OSO sufficient time to analyze the display, which has the quality of a satellite picture. Previously measured / fixated fence poles are preferred fix points to adjust the system accuracy. Precise commentary among the crew during the target run is necessary. The pilot immediately applies any course correction called by the OSO. The doors of the rear bomb bay open automatically 17 seconds prior to passing the target. The B-1B can deploy 84 Multi-Purpose Mk 82s and 30 CBU-97s simultaneously.

After a couple of turns I get the grip on it to take the reaction time of the jet into consideration. Depending on the speed we sweep the wings between 15 and 67.5 degrees. The actual position must be checked by use of mirrors.

Simply dropping the bomb is not it. Since the bombs would initially float on an air cushion underneath the belly when just gravity dropped they are forced outside by an explosive charge.

After more than an hour at low-level, our jet is moving towards a new challenge. Waiting at FL200 is a KC-135 tanker. Air refueling is part of nearly every mission, not only to take on fuel, but to train the pilot's ability and touch during this type of operation. Air refueling is part of the repertoire each pilot must be able to do. Only in this way can far away areas of conflict be reached in time.

Precision Work During Air Refueling

Shane takes over control of the jet: "I have the airplane." For him, a very demanding portion of the flight begins. Visual contact to the tanker is established and the B-1B approaches the extended boom very slowly. A refueling door in the nose of the B-1B is opened hydraulically. The bomber stagnates just a couple of centimeters apart from the boom. One can see the boomer's face very clearly. It's his job now to make the connection between the two planes. He hesitates a little and the connection is only made partially. Fuel spills over the front windscreen and decreases visibility very much. Shane pulls back slightly on the power and breaks contact. We still have more than one hour to practice this maneuver up to perfection.

"You have the airplane," Shane tells me and relaxes. I'm steering the plane towards home base. I still have 30 minutes left to get used to the handling characteristics up at altitude. We are gliding very stable through some turbulent air and the jet is behaving like at 300 feet before. Slow like a passenger plane. Abrupt maneuvers are not possible. Typical for a bomber of that caliber. Also rolling out after a turn requires some experience. After a couple of turns I get the grip on it to take the reaction time of the jet into consideration. Depending on the speed, we sweep the wings between 15 and 67.5 degrees. The actual position must be checked by use of mirrors. There is no feedback to the crew by noise or vibrations when changing configuration.

"Ready to talk to your home?" Rob asks me from the rear cockpit. He already has established an HF connection. To send a message to your home from a height of seven kilometers is something special.

For the landing we have to change seats again. Sharing the workload between pilot and copilot during this phase is necessary. Margin for error gets less the closer we get to the ground. During any kind of emergency in this phase of flight a passenger would only hamper the handling of the emergency.

Today though none of the over 100 warning lights comes on and all systems work perfectly. After 260 minutes flying time, the B-1B settles down again at Dyess AFB. We covered about 3000 km and used 48,000 liters of fuel. Slowly the B-1B rolls to the end of the runway to keep the stress on landing gear and brakes as minimal as possible. At a crawling tempo we taxi back into our parking position. With crossed arms our maintenance guy is signalling for the parking brake. Mission complete. Technicians take over the jet and get it ready for the next flight. A new crew is already standing by to take it for the next training sortie. Training around the clock—that's everyday business in the middle of Texas. ✈

(Editor's note: Lt Col Swoboda recently returned home after a tour at AFSC as German exchange officer. His report on flying in the B-1 appeared in the German *Flug Revue*, July 1999.)

OPS TEMPO And FLIGHT SAFETY

J. T. RAGMAN

"Ops Tempo and Flight Safety"—my topic for the Safety Down Day. It was time to put on my thinking cap. The question was a simple one: What can we, at the squadron level, do to minimize any potentially negative impacts that Ops Tempo may have upon flight safety? I addressed the question at the individual level, the crew level, and the supervisory level.

At the Individual Level

The Ops Tempo issue manifests itself as a "time crunch," with less time for anything and everything. Less time devoted to study equals less time to review the book knowledge required to remain "Safest." Less flight time devoted to training and proficiency equals less time to practice the procedures and maneuvers required to remain "Safest." Less time equals less "Safest."

Some Remedies

- Develop a personal study routine.
- Throw together some flashcards, compile a series of review sheets, and develop your own systems or procedures briefing guides. Review them the evening prior, the morning prior, or the hours prior to each flight.
- Encourage your training shop to develop a squadron "no-jeopardy" testing program covering systems, procedures, and regulatory guidance.
- Take full advantage of in-flight cruise segments by reviewing aircraft systems and "chair-flying" in-flight emergencies.
- Incorporate currency and proficiency items into all missions.
- Skip the ILS straight-in, and shoot the full non-directional beacon (NDB) procedure turn to a circle and to an assault landing.
- Skip the high-altitude single-ship weekend cross-country, and drop down for an SR/VR route in formation with a sister ship.
- Open the doors and run through an airdrop sequence with a simulated drop emergency thrown in for good measure.
- Make each and every flight hour count because they are precious and few.
- Equally important, know, respect, and correct your own Ops Tempo-imposed limitations. If you have not flown a full NDB recently—Rio Amazonas, Ecuador, non-radar, in the weather and/or in the mountains is not the time to regain proficiency. On the flip side, if you have not flown a full NDB recently, today's training mission may be the perfect time to regain proficiency.

At the Crew Level

An aircrew is a collection of individual crewmembers. Just as Ops Tempo impacts the flight safety of individual crewmembers, so too does it impact the flight safety of a crew.

Some Remedies

- As aircraft commander, flight commander, mission commander, or NCOIC, survey the proficiency needs of your crew(s), and plan the mission accordingly.
- Make the most of the flight time, complete as many proficiency items as possible, and incorporate Operational Risk Management principles throughout the mission.
- As an individual crewmember, advise the entire crew of your Ops Tempo-imposed limitations.
- If it has been months since your last live personnel airdrop mission, let the crew know.
- If you haven't flown formation wing in the weather in many months, let the crew know.
- If your last night assault to a dirt strip is lost in the back roads of your mind, let the crew know, and, with their help, remedy any proficiency items on this mission.

At the Supervisory Level

Supervisors who have been front and center on the flight safety message should be equally forceful with a related message: "Monitor individual currency and proficiency, prioritize the needs of the crew(s) on any given mission, and maximize every flight hour." These three messages go hand-in-glove:

- Flight safety requires proficiency.
- Proficiency is enhanced through optimal utilization of flight time.
- Flight safety is enhanced through optimal utilization of flight time.

FLY SAFE. ✈

("J. T. Ragman" is a pen name. The author is a C-130 pilot in the Air Force Reserve. He is also a Boeing 757 pilot and Human Factors instructor for a major airline.)

The Ops Tempo issue manifests itself as a "time crunch," with less time for anything and everything. Less time devoted to study equals less time to review the book knowledge required to remain "Safest."

USAF Photo by Dan Yacko

SSGT ROBERT J. PAETZ
3612 Combat Crew Training Squadron
Fairchild AFB, WA
Aerospace Safety, Jun 76

You have just been tossed out of your cozy, warm cockpit and now find yourself tumbling into a survival situation. That's a brand-new mission. Could you hack such a mission, not knowing what it entails? Unfortunately, a lot of aircrew members have forgotten they have an assigned mission even after they leave their aircraft. Let's look at what Uncle Sam says this mission is, and why.

The moment you depart your aircraft, Sam states you're to "return to friendly control without giving aid or comfort to the enemy, to return early and in good physical and mental condition." On first impression, "friendly control" seems to relate to a combat situation. However, even in peacetime, your environment may be quite hostile. Imagine parachuting into the Arctic when it's minus 40 degrees Fahrenheit. Would you consider this friendly? I doubt it. If you're forced to crash land in the desert where temperatures may soar past 120 degrees Fahrenheit, would this be agreeable? Hardly. The list is endless. Almost anyplace you might bail out, you can be confronted with situations difficult to endure. You *want* to "return to friendly control."

The second segment of the mission, "without giving aid or comfort to the enemy," is, of course, related to a combat environment. This part of your mission may be most effectively fulfilled by following our moral guide, The Code of Conduct. Remember, however, it should be followed at all times and in all places. It *does* apply to the peacetime situation.

The final phase of the mission, "to return early and in good physical and mental condition," will probably be the most strenuous to accomplish. The most

USAF Photos by Dan Yacko

Perhaps one of the most important psychological factors to remember is optimism. With today's modern technology, it's likely someone already knows you are missing and a rescue team is being organized to find you.

and psychological discomforts like creepy crawlers, flying insects, loneliness and maybe even "Sasquatch." Just by being in the military, you've had a chance to learn to tolerate uncomfortable situations. Fine. Apply this to your new environment. You'll probably find it's not so bad.

Facing and overcoming childhood fears is another threshold you may have to cross. Realistically speaking, everyone has acquired childhood fears. For instance, why do you usually turn on the bedroom light when it's dark, even though you've been there hundreds of times before and already know where every stick of furniture is located? Is it a habit or a reflex? Or could it be that when you were very young someone jokingly scared you in the dark? Maybe as a small child, someone told you not to leave the yard because wild animals in the nearby woods might get you. And now you may find yourself in a strange, dark woods that is the playground of these wild and ferocious animals. Old fears can be detrimental to your survival unless you learn to overcome them.

Perhaps one of the most important psychological factors to remember is optimism. With today's modern technology, it's likely someone already knows you are missing and a rescue team is being organized to find you. Like the old saying goes, "Keep the faith, baby!"

As you can see, the survival mission Uncle Sam has assigned you is not an easy one. This is just a peek at some of the ways you can succeed in that mission if you're ever "fragged" for it. If you find yourself in this predicament, I hope you'll remember your WILL TO SURVIVE is your way out! ✈

USAF Photo by Dan Yacko

Come Home To Mama

JANE GANTER SWANSON

NOTE: This article was printed in Flying Safety magazine, June 1959. We've made minor changes for sake of currency, but the author's message is true today, just as it was 40 years ago: Use your head and make it back home.

A recent article in *Flying Safety* pointed out the fact pilots in ever-increasing numbers fly from east to west and return over some of the wildest, most desolate country in the United States.

In calm confidence, they don lightweight flying suits—sometimes wearing only regular low-cut shoes—and pass across miles and miles of uninhabited regions.

"It can't happen to me" is the great American slogan. Any search-and-rescue coordinator in the Air Force can tell you it happens. Civilian rescue teams who have climbed, sloshed and plodded to the scene of aircraft mishaps will tell you it happens. Unhappily, these search-and-rescue teams too often return with the tarpaulin-wrapped bodies of those who didn't practice the fundamentals of survival.

Men do not die of being lost. They need not die of exposure. But they do commit suicide due to ignorance.

Repeated references to the inevitability of death by astonished survivors of bailouts in remote regions is downright sickening. Death is not inevitable. A person can live for several weeks without food. An individual can live for a couple of days without water. It may not be comfortable, but it's living. With a pint of water a day, under certain circumstances, a person can get along indefinitely, as long as there isn't too much exertion and working up of sweat.

Most pilots recognize the need for some sort of survival knowledge. Few ever get around to practicing it. When asked if matches are carried, for example, the typical pilot may reply (smugly patting a pocket), "Sure, I always have a pack of matches." A paper book of matches is about as useful for fire-building as a sponge if the bailout is in rain or snow, or the landing is in a creek.

The basic equipment for survival—indefinitely—is so simple. The most important piece of equipment is always with you. It is

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USAF Photo by Dan Yacko

Morale, hope, faith, God—whatever you choose to call it—is of primary importance.

your *brain*. Use it. Think.

Two completely opposite points of view are apparent in any study of case histories:

• Those waiting at home refuse to give up hope until they have positive proof of death.

• Those faced with survival in rough terrain sometimes give up hope before their parachutes are fully open.

Morale, hope, faith, God—whatever you choose to call it—is of primary importance. Experienced rescue teams know the value of morale, and often resort to ridiculous songs or stories to keep flagging spirits up during the course of a long, disappointing search mission.

Remember, "...those who are searching for you have a better chance to do the job than you will have searching for them." (from "Can You Handle An Emergency?" published by the Mountain Rescue Council, 1953.)

Too frequently, the first thought many people have after unharnessing from their parachute is "I must get help." The proper attitude is "I must stay alive and well *until help reaches me*." When the plane is reported missing, search-and-rescue procedures are initiated. Someone is looking for you. Stay where you can be found. Use the remaining hours of daylight, if any, to set up a camp. If it is dark, set up a camp anyway. You'll certainly be glad you had the foresight to carry those waterproof matches.

A striking misconception often voiced is, "If I had stopped, I wouldn't have been able to start again." Or, "If I had stopped, I would have died." Nothing could be further from the truth. Rest. Conserve your energy. Protect yourself from shock. You will undoubtedly be hungry. You may have to look around for water. The more a person wanders about aimlessly, the more energy that is wasted, and the more water that is lost through perspiration.

Experts in survival recommend a procedure along these lines: If injured, tend to those injuries. Shelter then becomes the primary concern. "Holing up" serves a dual purpose of keeping your mind occupied and your body warm. A variety of shelters and lean-tos can be constructed from a parachute. The parachute may be used as a sleeping bag and a shelter made of boughs. In snow, a trench or cave may be dug to give protection from wind and weather. You will not freeze to death while sleeping. Getting chilly will wake you up. Sleep often during the time you are awaiting rescue. Besides conserving body heat and energy, you'll require less food and water.

Arrange for signaling to those who are searching. A fire is best. Have a good, hot fire going, with green boughs, shrubs, or leaves piled nearby to throw on for smoke when search aircraft are heard. Those waterproof matches are important. It's also im-

portant the fire be burning well before you dump all that damp stuff on top.

Mute evidence of a fire that wouldn't start is often found near the body of a victim. Dead wood which is wet on the outside can often be split (a knife is convenient, but not essential) to reveal dry tinder inside. A fire fed with slivers of this tinder can be built up and will then help to dry other fuel. This may include some kinds of bark or pine cones, which are highly combustible. Twigs and dead wood may be found by digging down under the wet or snowy surface. (It has been said the quickest way to get yourself surrounded is to set a fire in a National Forest. Forest Rangers will appear from nowhere to ask for your permit! Don't count on it.)

When shelter and a signal fire are taken care of, it's wise to find a source of water. Fortunately, little streams are usually abundant in the mountains of the West. Snow can be melted or eaten as is. If you choose to eat it, slosh it around in your mouth to warm it up and prevent stomach upset.

Food is the least of your worries. The human body can live off stored fat for a couple weeks. (A week without food might even improve your figure!)

After you are well settled, you may decide to explore the possibilities of getting out of there. A common mistake is packing up and leaving and aimlessly looking for help. Work from your base camp. Explore systematically. It's usually wise to look for high ground where a wider view is available. The old routine of following the stream to its mouth could take you deeper into nowhere. If a more advantageous campsite is found—like near a large clearing that would accommodate a chopper—allow yourself daylight hours to move and set up another camp.

Don't just sit down to die. Don't walk around solely for the "If we're going to die, we're going to do it walking" reason. Somebody at home is sure you're going to come back alive. And you can!

There might be really lousy weather conditions that prevent search planes from seeing you for a few days. These same weather conditions may very well prevent you from getting out on your own. With all this time on your hands, you'll want to take advantage of the various "recreational" facilities at your disposal.

If fishing is your game, ripcord pins can be ground down on a rock to make workable fishhooks and nylon shroud lines can make up the fishing line. Now you're all set for an afternoon of sport!

On the other hand, you may not care much for fish. But don't those snowshoe rabbits look delicious? Filament from parachute shroud lines can be used to make a snare. A loop attached to a bent limb on the trail where you noticed animal tracks will catch your dinner. And aren't you glad you had those waterproof matches in your flight suit? Raw rabbit isn't very tasty.

All this may sound ridiculous to the pilot who flies mostly in southern Arizona. Those in the Cascades or Rocky Mountain areas may see some logic. A number of people have dressed for Florida weather and found themselves atop Cedar Mountain in Washington state.

Dress in reasonably warm clothes when flying. You won't suffocate. Wool socks may be worn without discomfort in warm weather. Many athletes wear them all the time for their excellent absorption qualities. Wool socks in a survival situation may save your toes from the surgeon's knife.

A flight jacket—you can always turn off the heater—is comfortable and may save your life if you bail out or crash land.

There is someone looking for you. If the terrain is such that rescue can't be made right away, food, supplies, and even doctors, can be dropped to you. After all, you probably got there via parachute yourself.

And remember, there are very important people waiting for you. They will keep on hoping. The least you can do is keep on trying. ✈

1LT GARY RAFNSON
89 FTS
Sheppard AFB TX

Don't fly sick.

It seems like a pretty simple statement. Every pilot in the military and civilian world knows about the detrimental effects of flying with a cold. This story is just a reminder of that fact.

It was Sunday morning at Randolph AFB. My student and I were supposed to fly a two-hop back to Sheppard AFB and conclude my first ever cross-country as a T-37 instructor pilot (IP). The only problem was that I wasn't feeling too well. I had a fever and my nose was running. I could barely valsalva (clearing your ears by blowing your nose).

The little voice inside my head was telling me to knock it off. Call the leadership back in Wichita Falls and let them know what's going on. Maybe we would stay an extra night and press on in the morning. Maybe they would arrange for us to fly back commercial and send someone to pick up the jet.

But what would they think? The only IP from the entire wing to not return from a cross-country weekend is the FAIP (First Assignment Instructor Pilot) with only three weeks on the line? Besides, my wife and 11-month-old daughter were back home waiting for me. My student's wife and two daughters were waiting for him.

As you can guess from this story, get-home-itis and inexperience prevailed over airmanship and sound judgment. We made the first hop from Randolph to Navy Fort Worth at 16,000 feet, 8000 less than what we planned. The lower altitude hurt our fuel consumption, but I figured the lower altitude would allow my ears to valsalva properly in the unpressurized cockpit of the T-37.

Things were running smoothly until the descent into Dallas airspace. Passing 10,000 feet my ears started to hurt. I felt pressure in my eyes. I found momentary relief after a valsalva, but it was getting harder and harder to clear my ears. I was feeling so bad that I limited the number of approaches to two, even though we had the fuel for four. I even let the student fly unhooded to help me clear in my uncomfortable condition.

Clearly it was time to knock it off. Let them drive down and get the plane. Our families could wait the extra day if neces-

USAF Photo by SSgt Andrew N. Dunaway, II

sary. It wasn't worth the little training we could get, and my head was probably already out for the count.

But we were so close! We made it this far, we might as well go ahead and fly home.

We flew back to Sheppard at 6000. Crossing the VORTAC for Lawton we started to descend into the radar pattern at Ft. Sill. The instant we left 6000 I again felt pain throughout my head. I used my Afrin but it didn't help. The student shot one approach unhooded and we flew back at 250 knots to the ILS full stop on the center.

The debrief was extremely short. I drove to the emergency room where the doctor told me to take Tylenol for the pain and to see the flight surgeon in the morning.

The next day, all of flight medicine was waiting for me and knew my name. The doctor literally said "Whoa!" as he looked in my ears. Everyone in that office looked in my ears that morning. No one had ever seen barotrauma that bad before. They immediately sent me over to the ear, nose and throat specialist, pulling him away from a patient in the process. They sat me down on a special table where I could see my ears on a TV screen.

All I saw was blood and skin. The doctor then pointed out the bones in my ears, the ones that are supposed to be behind my eardrum. I was told about nasal steroids, chronic eustachian dysfunction, and waivers for tubes in my ears. I was also told about the possibility of being permanently assigned to something low-flying, like helicopters. I was also told that I might never fly again.

I had a lot to think about for the next 35 days. That's how long it took for my ears to heal. And I was prepared for the worst when I met with the ear surgeon on 30 August at 0900 in that little room that smelled of alcohol. But the pilot gods spared my young FAIP wings that day. I was flying with students again a week later.

Take it from someone that almost lost it all from being stupid. Don't push it. Flying puts unique stresses on the body that minor colds and over the counter medications can make much worse. And in AETC, there is no mission so important that it can't be flown tomorrow. ✈

CMSGT MIKE BAKER
Maintenance/Technical Editor

It's a fact that nearly all mishaps are attributable to human error—not material failure, "unavoidable accidents," or "acts of God." Here are the "causes" from some recent mishap reports that underscore this distressing fact. As you're reading them, please keep two things in mind: The first 10 of these 11 mishaps resulted in 44 lost workdays due to injuries and more than $156,261 in medical care and equipment repair costs. Second, each mishap represents injury to a maintainer or damage to a national defense asset that didn't have to happen.

• While connecting a trailer to a vehicle, the mishap worker (MW) failed to realize one of his fingers was between the pintle hook and the trailer tongue. He ended up with a broken/crushed finger.

• The MW had been on duty for more than 12 hours and had been working extended duty hours for several days running. While working on an aircraft, he fell backwards from it, breaking his wrist.

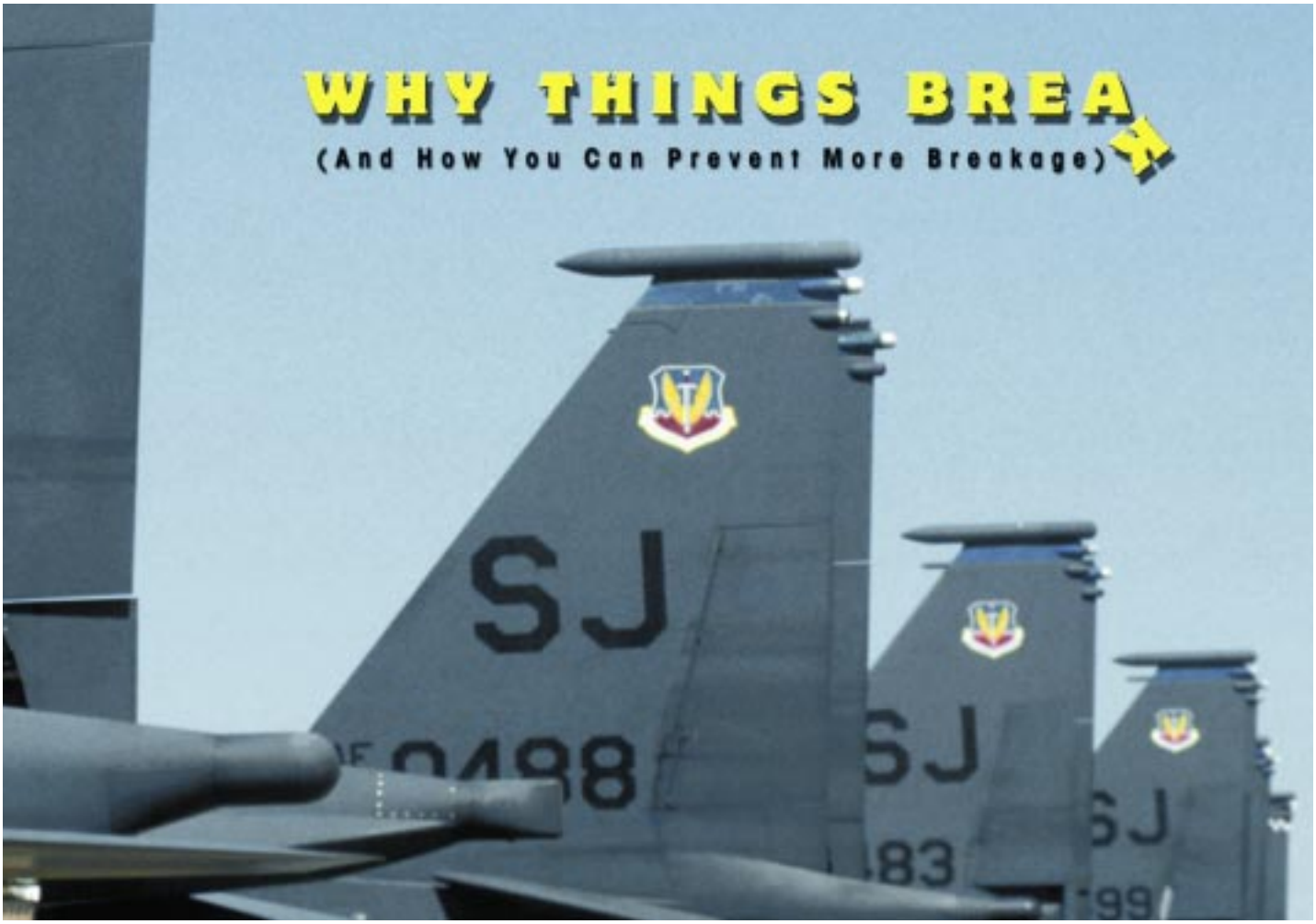
• The MW disconnected the tow bar from the aircraft and was maneuvering it to reconnect it to the tow vehicle. He only diverted his attention from the task momentarily, but long enough that he ended up crushing his hand between the half-ton tow bar and tow vehicle pintle hook.

• Prior to swinging the gear on an aircraft on jacks, the MW failed to notice that a panel in a MLG wheel well was open. When the landing gear handle was placed in the gear retract position, one of the MLGs contacted the panel, destroying it.

• The mishap supervisor (MS) failed to follow all applicable tech order steps before adjusting the speed brake limit cam switch. Result? Speed brake damage.

• While performing speed brake maintenance, the MW and MS ignored several tech data steps. Their disregard ended in speed brake damage.

• Worker bee maintainers failed to follow tech data and installed incorrect wheel bearings. Their supervisors failed to perform re-



USAF Photo by SSgt Andrew N. Dunaway, II

quired IPIs (or performed them incorrectly) and didn't detect the incorrect wheel bearings. Result: Bearing failure and near-catastrophe for the aircrew and aircraft.

• The tow team supervisor failed to verify the hangar doors were fully opened and the aircraft's vertical stab sustained damage.

• The tow team tail walker failed to notice a fire bottle in the path of the tow. The tow supervisor saw the fire bottle, but thought there was enough clearance. The aircraft hit the fire bottle.

• The MW failed to install the prescribed grip-length rivets on a trim panel. The panel was discovered missing after the aircraft's next flight.

• Finally: Even though directed by tech data, no one checked for, and then drained, water from the aircraft's pitot-static system. The water froze during climbout, caused erroneous airspeed indications, and the aircraft entered a full-out stall. Loss of an aircrew and aircraft was narrowly avoided. (This is the one mishap we couldn't assign a dollar value. We do suspect it cost some maintainers a lot of credibility.)

Since we never seem to have enough bodies to take care of the work we already have, then it makes sense that we should prevent injuries to ourselves by playing it safe, wearing required personal protective equipment (PPE), and using tech data. Using tech data every time is pretty good insurance that you'll prevent equipment damage, too. You've seen some examples of why things break. Here's how you can do your part to prevent more breakage:

• Always follow tech data. If wasn't Murphy, then it was a close cousin who said: "The longest distance between two points is a shortcut."

• Use that PPE every time.

• Never hesitate to call "Time Out" or "Knock It Off" when a situation is unsafe.

• Remember: There are no "small" jobs in maintenance!

Ops Topics Presents...

The "Hitting One Of These Things Could Be Deleterious To Your Health (Read: Kill You)" Edition

Things that go "Bump" in the night may or may not make you uneasy. But all of the things that go "Bump" on your aircraft should. We'd like to think that one or more of the mishaps described here will stick with you on future flights and help you avoid those things that would bump into your aircraft. Or help keep *you* from bumping into things you shouldn't. Fly Safe.

But We Don't Wanna Play Chicken!

Would you believe three C-141s versus 11 F-16s? Alright, then how about one C-141 versus two F-16s? Believe it. These three unwitting—and unwilling—participants were recently involved in some unscheduled air combat maneuvering (ACM) that resulted in a near midair collision (NMAC).

A three-ship of Starlifters was inbound to a foreign airfield. At 15 miles, they were cleared for approach and told, "Report five miles" at 2500 MSL. There were no traffic advisories.

At the same time, an 11-ship of Falcons was departing the same airfield with spiraling up, left turns from 1500 MSL to 15,000 MSL.

The crew of the lead C-141 learned of the F-16s and started a left turn at seven NM to reverse course from the field and enter a safe orbit until the F-16s were clear. Ninety degrees through the turn, the lead C-141 found itself head-to-head (!) with two F-16s. The Starlifter pushed over and the Falcons passed over the top with an estimated miss distance of less than 500 ft. About 25 seconds after the unscheduled ACM took place, tower instructed the three-ship of C-141s to hold at 10 NM west of the field.

Reconstruction of events leading up to the NMAC revealed the following circumstances:

- The C-141s weren't advised of the F-16s departing the field.
- The F-16s weren't advised of the C-141s arriving the field.
- The tower at the field wasn't radar-equipped.
- A language barrier was a contributing factor.

Lessons learned? See-and-avoid is still one of the most important basic flying skills. Use it and avoid being involved in a midair collision.

Globemaster Birdstrike

The C-17 was departing a foreign airfield when, just after rotation, a flock of more than 100 sea gulls appeared in the flight path. Having no option but to fly through the cloud of birds, the crew immediately returned for a landing to check for damage. Inspection revealed a hole in an outboard flap and damage to the No. 1 engine.

This crew was lucky. The birdstrike event could just as easily have ended with a Safety Investigation Board concluding that the loss of aircrew and aircraft—not unlike the Elmendorf AWACS Class A mishap in 1995—was ultimately due to birds.

In the world of the Expeditionary Aerospace Force, flying to non-US/non-NATO military airfields and non-US/non-NATO civil airports is the norm, not the exception. This is particularly true

for those in the air mobility business.

So what's a crew to do to minimize the probability of a bird or other wildlife strike when transiting unfamiliar airfields? From the USAF BASH (Bird Aircraft Strike Hazard) Team here at the AF Safety Center, here's some advice:

- Whenever possible, avoid takeoffs and landings during the hour before and the hour after *sunrise*, when birds are likely to be very active.
- Whenever possible, avoid takeoffs and landings during the hour before and the hour after *sunset*, when birds are likely to be very active.
- If you must launch during these sunrise / sunset windows, have airfield ops perform a runway sweep to look for any wildlife hazards.
- Learn everything you can about the airfield before you go there. If possible, talk with crews who have recently been there and get a feel for how well the ramp and airspace are monitored for wildlife activity.
- Share what you learn about the airfield with other crews who may also transit that field, whether it's via a read file at the unit home drome or at the deployed location.
- Once on the ground, and especially if amenities don't extend much further than a tower and rudimentary refueling and other support services, be proactive. Stroll the field or, better yet, borrow a vehicle and recon the area to see what kind of wildlife is present. Does it appear airfield management is actively engaged in preventing conflicts between aircraft and wildlife? If not, are they willing to assist and take positive measures to help ensure you're able to depart with a greater margin of safety?

The Bottom Line: It's up to the aircrew to identify hazardous wildlife conditions. *Be* proactive. *Push* for action to be taken. *Do not* accept risks unnecessarily.

F-16 Wire Strike

It was a single-ship F-16 sortie supporting an ongoing series of tests in a mountainous region near several Restricted Areas. As part of the mission, the mishap pilot (MP) was required to make several low-level, high-speed passes in his Electric Jet. He completed the passes without incident.

On RTB, the MP entered a low-level route on his return path. The low-level was at 250-300 ft and 450-500 kts and uneventful until approaching a Restricted Area bordering the route. That's where the MP encountered a 6500 ft long, one-half inch thick, high-strength, steel cable stretched across his flight path. Luckily, the cable wasn't "high-strength" enough, and the motion and mass of the Falcon severed it. The MP successfully nursed his aircraft home where it was determined damage was confined to one wing. Total repair cost came out to a little more than $38,000.

The USAF could easily have lost an aircraft—and perhaps a pilot—had the cable hit something critical and rendered the jet uncontrollable.

The FAA requires obstructions over 200 ft to be marked with visual marker balls. Turns out that high winds and severe weather had dislodged the marker balls in the past and they hadn't been replaced. In addition, close scrutiny of area maps after the fact found they did indicate presence of the wire, but the words "Aerial Cable" were in very small print.

That the cable wasn't properly marked with ball markers and more clearly visible to the naked eye is moot. That the words "Aerial Cable" were in small print is also moot. What does matter is this: When "other folks" don't abide by the rules and flag their obstacles so you can see 'em, your meticulous flight planning may be the only thing that guarantees you and your jet get home safe and sound.

C-21 Vs. RCA (Radio-Controlled Aircraft)

We recently featured a rather bizzare Ops Topic describing a near mid-air collision between a USN SH-60 and an RC aircraft at NAF Atsugi, near Tokyo, Japan. A check of the archives turned up a similar event that occurred in February 1998 near Yokota AB.

The mission was a day training sortie for instrument approach work followed by visual touch-and-goes. The C-21 was in final turn for a visual to runway 36 at Yokota, when a five-foot long RC aircraft in a vertical climb passed within 100 ft. The NMAC occurred over the TAMA River, at approximately the 3.3 DME point south of Yokota TACAN, which is (at least it was then) a well-known location for RC aircraft activity. Authorities have warned RC aircraft club members of the hazards associated with operating their model aircraft near real aircraft, and local procedures have been established to alert the "powers that be" of future recurrences. Pilots encountering RC aircraft in Yokota airspace should immediately notify tower of the hazard.

By the way, it isn't known whether the pass the RC aircraft made near the C-21 was accidental or deliberate...So be careful out there. ✈

Maintenanc

Maintenance Matters Presents... The ORM Edition

You've probably heard the saying "You can't legislate common sense." Well guess what? Since it became an integral part of the Air Force culture a few years ago, Operational Risk Management *has* "legislated" use of common sense. It would be a mistake to believe that ORM is a fad, that if ignored long enough, will go away.

AFI 91-213, *The Operational Risk Management Program*, directs all Air Force personnel to use common sense—that is, apply ORM principles—both on- and off-duty, in order to "...minimize hazards and guarantee operational success."

As illustrated in the following anecdotes, applying ORM would have identified the high-risk components of these routine, low-risk tasks and prevented injury, while saving time and money.

There's a line in a song that goes "Some days you're the windshield and some days you're the bug." Use ORM and you'll be the windshield. If you don't use ORM, then you'll be...well, you know.

Remember: When you hear the letters "ORM," think "Common Sense."

The USAF's Six-Step ORM Process:

- Identify the Hazard
- Assess the Risk
- Analyze Risk Control Measures
- Make Control Decisions
- Implement Risk Controls
- Supervise and Review

Some ORM Factoids:

- AFI 91-213 and its companion publication, AFPAM 91-215, *ORM Guidelines and Tools,* are being tweaked and moved from the "Safety" category, to the 90-Series "Command Policy" category. The soon-to-be-released versions of these ORM publications will be AFPD 90-9, *Operational Risk Management*, AFI 90-901, *Operational Risk Management*, and AFPAM 90-902, *ORM Guidelines and Tools.*
- The Risk Management Information System web site (http://rmis.saia.af.mil) is a user-friendly resource that will help you understand, apply, and share risk management information with others. Categories include CrossTell, Lessons Learned, and Tools, among others. You can read risk management lessons from others, as well as post your own. Visit the RMIS web site and learn more about how to mitigate hazards in your workcenter.
- ORM isn't just an Air Force program—it's a Department of Defense program. You'll find ORM is being integrated into the cultures of all of our sister services, too.

Crunch Time

When doing routine work, we typically rely on our "internal autopilot" to keep us on track and out of trouble. Our internal autopilot usually does an excellent job. But don't forget: We're most likely to be lulled into a false sense of security when doing a task we've done a hundred times before. And when that false sense of security overrides our natural caution, an injury or damage to property (or both) can result. Such was the case here...

The task was a routine one: Tow an aircraft from the hangar to its parking spot on the ramp. The tow went flawlessly, and now that the tough part was over with, all the tow team had to do was police up its equipment and head back to the shack.

The team disconnected the tow bar from the aircraft, then disconnected it from the tow vehicle, and our mishap maintainer (MM) and another troop proceeded to reposition the tow bar to reconnect it to the tug. The MM, with lots of aircraft tow experience under his belt, was on the end that was to be connected to the tug's pintle hook. He and the other troop almost had it reconnected when, the momentum of a 1000-pound tow bar being what it is, the MM's hand got—suffice it to say—crushed. Surgery to repair broken bones was successful and, after a few days in the hospital, the MM was released with prognosis

ce Matters

that he would make a full recovery.

I guess that's where the saying "The job's not complete until the paperwork's done" comes from. This maintainer learned a lesson the hard way. We challenge you to learn from his example and remember it's those "routine" jobs that will turn around and bite you when you take them for granted.

Hit And Run

The flight plan called for an en route RON at a civilian airfield overseas. The flight there was uneventful. The crew parked its trusty C-141 Starlifter in the designated hot cargo area, sealed it, and went into crew rest.

A few hours later, one of the airfield's night shift employees reported for work and, as was his custom, proceeded to make the usual rounds. That's when he discovered the parked C-141 in the hot cargo area. But not visually. He discovered it with his *truck.*

Unlikely as it may seem that someone could actually drive a vehicle into a parked aircraft as big as a C-141, this mishap just goes to prove that the improbable can and does (and will continue to) occur to the unwary. In this mishap, the vehicle was totaled but the driver escaped serious injury. The Starlifter? The collision did $600,000 damage to an engine and its pylon, and the USAF suffered temporary loss of a critical air mobility asset.

Moral of the story? If you're a Pro Super, Expediter, Gofer, or somebody else whose office is a vehicle on the flightline, then you've undoubtedly completed "How To Stay Out Of The Way Of Taxiing Aircraft, 101" successfully. But how often do you think about the hazard moving vehicles pose to parked aircraft?

In these days of unrelenting ops tempo, it's likely that transient aircraft regularly transit your station. Maintain SA (situational awareness) and don't *assume* you know where everything is parked—make sure.

Fire In The Hole!

Latrine servicing on passenger-carrying aircraft: A benign, routine undertaking, right? Well maybe not, as the aircrew on this jet found out.

Everything was routine until takeoff. Then, on initial climbout at 25 ft AGL, lots of circuit breakers started popping and several caution lights illuminated (not good!). The crew executed an immediate go-around, landed safely, and left it to maintenance to assess damage and determine what had gone wrong.

Seems there was a little too much "liquid stuff" introduced into the lavatory system, and on climbout, it leaked out. Seeking to find its lowest level, the liquid did—hence the snap, crackle, and pop of electrical components and their circuit breakers.

Remember: When it comes to preparing multi-million dollar aircraft for flight, there are no small jobs. Follow that tech data.

An Eagle With Indigestion

Three troops were tagged to fix an ECS problem on an F-15. Troubleshooting required an engine run, and since ground communications among the three maintainers was an absolute necessity, along with tech data and tools, they rounded up headsets and comm cords.

Start-up was normal, troubleshooting was in progress, and it was pretty much as routine a ground maintenance run as you could ask for when it happened: The idling No. 1 engine started pulling the ground observer's comm cord toward it. The ground observer saw what was about to happen, but wasn't able to act quickly enough to prevent the comm cord from entering the intake and FOD'ing the engine. Engine damage totaled nearly $124,000.

Do you think a little more ORM would have made the difference between an MC and an NMC jet? ✈

USAF Class A Mishaps

FY00 Flight Mishaps (Oct 99 - Jan 00)

6 Class A Mishaps
4 Fatalities
3 Aircraft Destroyed

FY99 Flight Mishaps (Oct 98 - Jan 99)

14 Class A Mishaps
7 Fatalities
13 Aircraft Destroyed

3 Oct	♣	**While conducting a SAR mission, a UH-1N went down.**
17 Nov	♣	**Two F-16Cs flying a night vision goggle upgrade sortie collided during a VID intercept. One pilot ejected and was recovered uninjured. The other pilot returned safely to base.**
22 Nov		**An OA-10A departed the departure end of the runway. The pilot ejected successfully.**
6 Dec	✶	**An RQ-4A Global Hawk UAV was extensively damaged while taxiing after landing.**
10 Dec		**A C-130E touched down short of the active runway, then diverted to another airfield and belly-landed. Three personnel were fatally injured.**
15 Dec		**An HH-60G rolled over at an LZ following a hard landing.**
20 Jan	♣	**An A-10 crashed during RTB. The pilot was fatally injured.**

- ❏ 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 dollars.
- ❏ These Class A mishap descriptions have been sanitized to protect privilege.
- ❏ Unless otherwise stated, all crewmembers successfully ejected/egressed from their aircraft.
- ❏ "♣" 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 daily and may be viewed at the following web address by ".gov" and ".mil" users: http://www-afsc.saia.af.mil/AFSC/RDBMS/Flight/stats/index.html
- ❏ Current as of 26 Jan 00. ✈

Whoops, we goofed! Here's the corrected table from our Jan/Feb 00 Mishap Review issue, Engine Review, page 37. Corrections are in red.

Table 2

F-16 Engine-Related Destroyed Aircraft Statistics				
	FY98		FY99	
Engine	Aircraft Losses	FY98 Rate	Aircraft Losses	FY99 Rate
F100-PW-200	0	0.00	0	0.00
F100-PW-220	0	0.00	5	3.98
F100-PW-229	0	**	0	**
F110-GE-100	2	1.34	3	2.04
F110-GE-129	1	1.60	1	1.55
All Engines	3	0.79	9	1.64

**Insufficient flight hours on these engine applications to compute a meaningful mishap rate.

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THE Well Done AWARD

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.

SSGT ROBERT T. WILLIAMS

393 Bombardment Squadron
Whiteman AFB, Missouri

On 1 December 1997, SSgt Williams was performing a preflight inspection on his B-2 aircraft. During the inspection, he noticed a wear plate for the No. 2 engine auxiliary inlet door appeared to be installed incorrectly. Though not a normal preflight item, he investigated further and found the wear plate was missing a rivet. This discovery was the "Golden BB" that led safety investigators directly to the most likely cause of engine damage found on another B-2 aircraft.

A one-time inspection for the B-2 fleet was initiated, and it uncovered a serious design deficiency. A category one deficiency report was submitted, and within 24 hours, an emergency action TCTO was issued, and field-level modification was underway.

SSgt Williams' outstanding attention to detail averted a mishap that could have cost millions of dollars in damage and aircrew member lives. His professionalism and decisive actions preserved the combat capability of the 509th Bomb Wing and made the B-2 a safer aircraft to fly.

Well Done!


ONLY YOU!
...Can Prevent GLOC
USAF Photo by SSgt Andrew N. Dunaway, II