flying

SAFETY

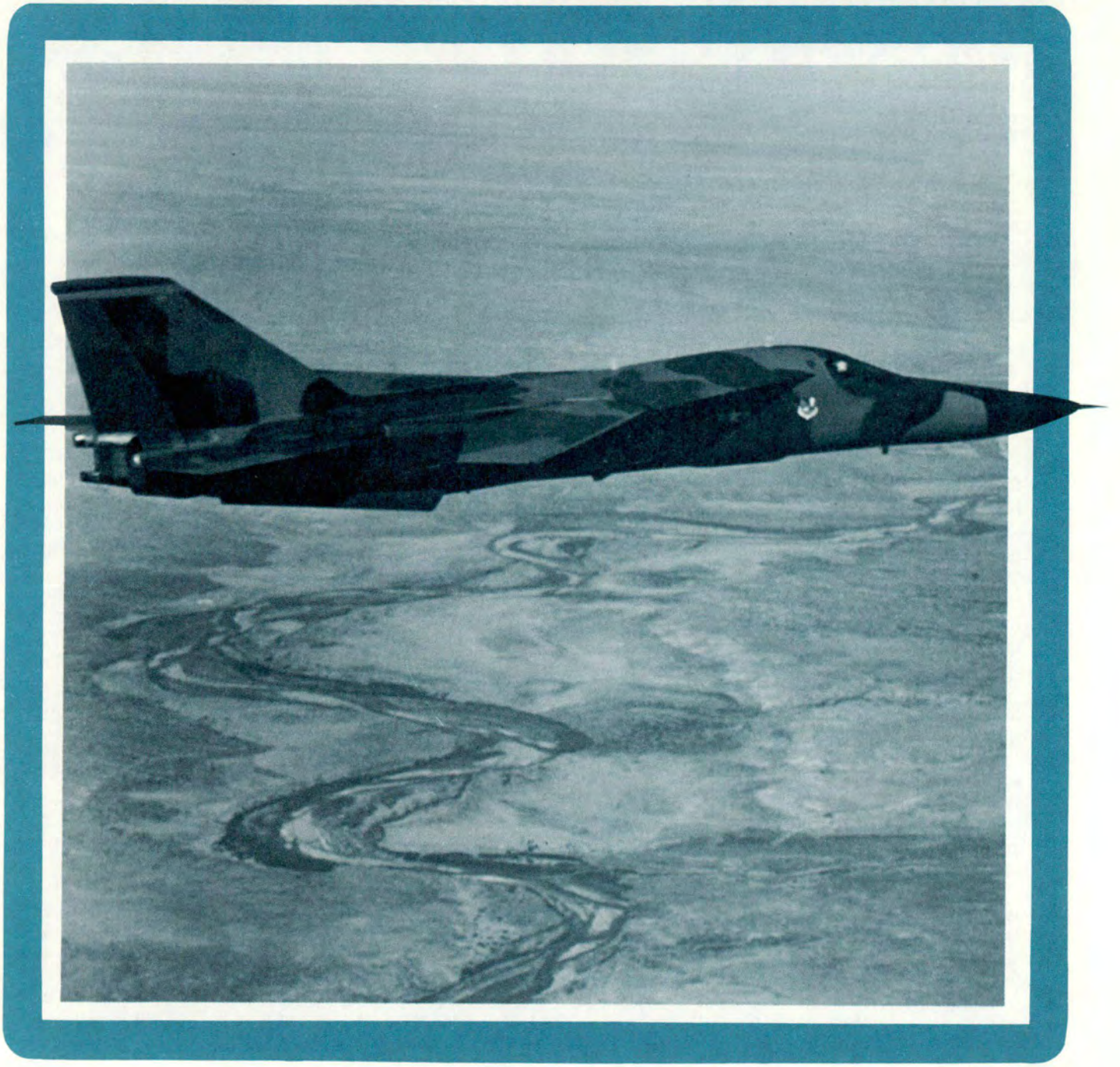
JULY 1987

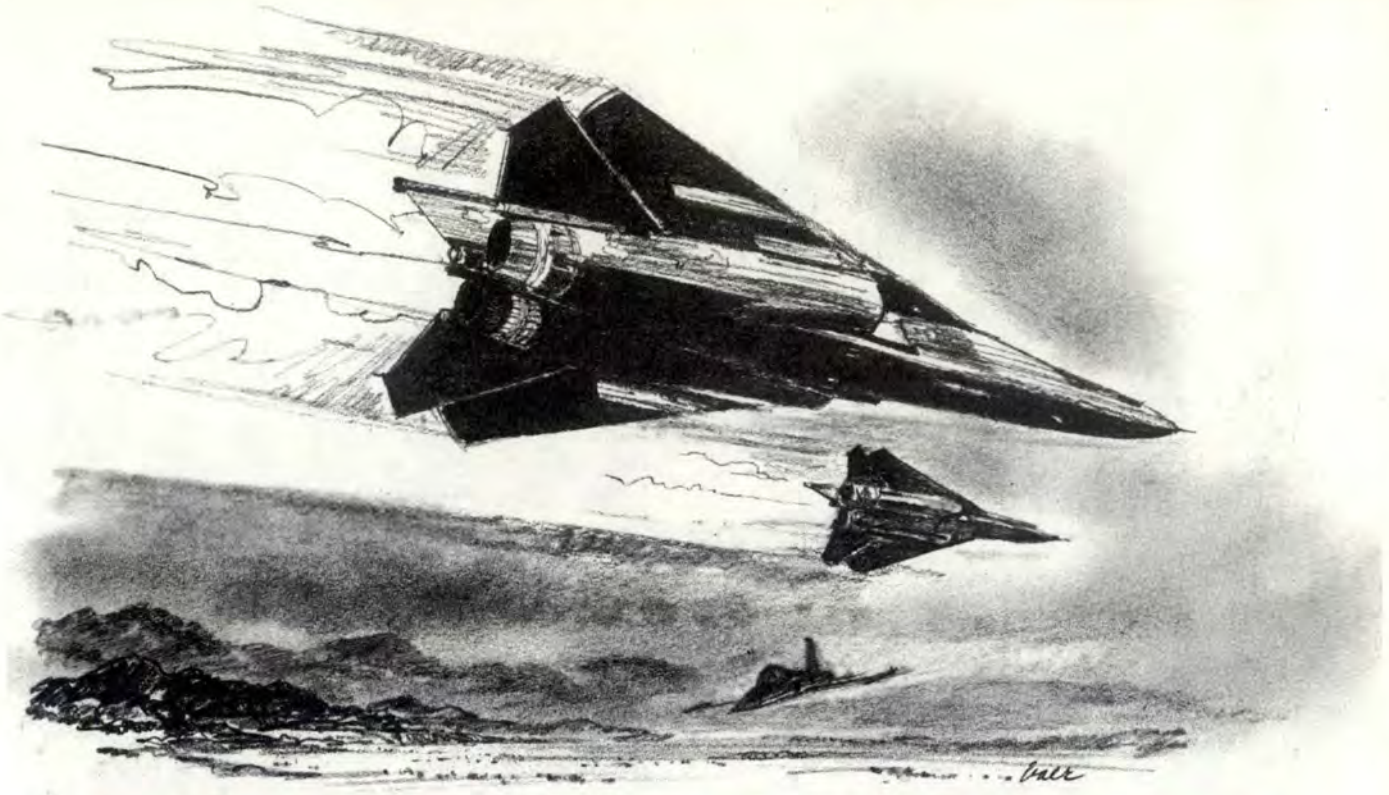
Rules of Engagement

The Corker Counselor

False Horizons

Six Minutes To Eternity





THERE I WAS

■ My first trip to Red Flag in the FB-111 was a 2 week TDY, and we were on our ninth and final sortie on the tenth and last day of the "war." Both Nellis and Las Vegas had been fun and educational in many ways, but like just about everyone else, I was ready to go home.

During the last few days, the intensity of the exercise and the requirements for maximum concentration began to peak. Live ordnance was being released regularly, and deconfliction problems began to gain a lot of attention as compression of TOTs and target area saturation were emphasized.

Formations began pushing the gap at 30 second intervals, and that's not much when planes are ingressing at 540 knots and egressing supersonic. Into that, add aggressor aircraft, ground threats, C-130s, French Jaguars, Wild Weasels, and terrain following attackers, and there is a high potential to see someone where you don't expect them.

See and avoid was obviously high priority. Today, however, we didn't expect to see much since all the F-15s who had previously been trying to down us were now on our side. We still had aggressors (F-5s) challenging us, but we hadn't seen them on previous sorties and didn't think they would be a factor with F-15s providing CAP. If it had been real combat, we probably would have had the nerve to call it a cake walk.

The weather was bad as we entered the range, but as we expected, it cleared near the target area. The excitement began on the bomb run, but that's not unusual for guys who find the IP inbound to be fun. We took 30 second spacing on lead to simulate the frag of a MK 82 even though we were only dropping smoke-producing MK 106s.

As we neared the target, we spotted lead's smoke well placed on a column of trucks. The bombing system looked good as the time-to-go counted down to zero. Bomb away! We banked and pulled, and in the turn, I could see our smoke also on target. We rolled out at 300 feet with burners lit and lead in sight, with a planned join up at Mt Helen. We would then blast through EC West avoiding ground threats and trying to keep from going supersonic over the manned sites.

I checked our rear and saw an F-5 beginning to convert, called it to lead, and thought to myself we might have fun today after all. We rocked our wings so the aggressor knew we had him visually, and after a short chase, he broke off and climbed to our 3 o'clock. We then heard lead call "Chili Flight, AAA

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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RULES OF ENGAGEMENT . .

PHOTO 1. Initial impact of three MK-82s. Note the shock wave and the bright flash the pilot saw.

PHOTO 2. The fourth bomb has just exploded. Note the puffs of dust from shrapnel impacts.

DAVID J. COLLINS
Embry-Riddle Aeronautical University

■ How many times have you violated the rules of engagement (ROE) "just a little?" Did anything exciting happen because of it? Probably not. Most flyers tend to have quite a bit of luck. Could something exciting happen because of it? Let me tell you just how exciting it can get.

The Place: Nellis AFB NV
The Time: 0800 hours
The Mission: Green Flag — a tactical flying exercise for training aircrews to fight and win in a high threat, high communication jamming environment.

The Background

Because of the jamming, all missions received a secondary target to preplan, and after takeoff, each mission would try to contact the Airborne Command and Control Center (ABCCC) to receive the coordinates of their primary target.

Effectiveness of the jamming prevented ABCCC from passing most of the targets to the fighters. Being innovative, some of the fighter crews began contacting the ABCCC crew prior to launch to receive their primary targets, thus circumventing the jamming. To these crewmembers, there was nothing wrong with this except it was against the ROE.

Sequence of Events

0800 hours: My weapon systems officer (WSO) and I spent an hour mission planning for our secondary target, an airfield on the Nellis Range, and another hour coordinating with the flights in our "gorilla" package of 12 other missions. The Warlord (overall package commander) pointed out several blocks on the range map, 10 nautical miles square, and distinguished these as areas where live weapons releases would take place. He ordered flight commanders to deconflict their missions by either space or time.

1000 hours: The flight leads met with the Warlord for a time hack, weather briefing, and final "big picture" mission brief. The sky would be overcast at 12,000 feet with good visibility and no significant weather. All targets and routes of flight were reviewed.

Our target was in the southeastern corner of a live weapons release box. The live release target in the box was shown as an airfield 5 nautical miles to the northeast.

Our time-over-target (TOT) was

. WHO NEEDS THEM?

PHOTO 3. The aircraft is now over the impact point of the fourth bomb. Note the shrapnel impacts.

PHOTO 4. The aircraft is now over the impact point of bombs two and three. The total elapsed time from photo one to photo four — 3/4 second!

1405± 2-½ minutes. The live drop, by a flight of F-16s carrying MK82 500 pound bombs, was scheduled for 1410± 2-½ minutes.

1230 hours: We left the squadron area for our aircraft, which was still not crew ready, hoping our presence would somehow speed up the maintenance process.

1340 hours: We finally launched 10 minutes late following the maintenance delay, forcing an adjustment in groundspeed to compensate. Through some quick calculating, we determined we could make our TOT window if we flew the mission at 600 knots ground speed (KGS) versus the 480 KGS originally planned. I descended to 300 feet above ground level (AGL) approaching Student Gap and enjoyed the sensations of speed and acceleration as I lit the afterburners.

The jamming prevented contact with ABCCC, so we stuck with our preplanned mission. We spotted several "aggressor" aircraft along the flightpath to the IP but none were able to get within firing parameters. My WSO was keeping a close watch on the time throughout this portion of the mission. We didn't want to enter the live weapons release box if we would be unable to exit before the end of our TOT window.

As we approached the IP, I asked the WSO for a time check. He said we were 15 seconds within our TOT window and could make up at least another 10 on the IP to target run. Our target airfield was on the southern edge of the live fire box so with a southern pull off target, we would be out of it with 10 to 15 seconds to spare.

I lit the burners again and accelerated to mach one (the range area is 5,000 feet MSL and approved for supersonic flight). The target came into view, and I visually cleared for other aircraft in the area. Seeing none, I started my run and called for cameras on.

1407:05: Just as we crossed the airfield threshold, I saw a bright flash on the ground in front of me. It instantly disappeared below the nose of my aircraft followed by a muffled thump which shook the jet. I called cameras off, climbed to 1,000 feet AGL, slowed to 480 KGS, and turned hard right to look back at my target. The airfield was an inferno of exploding bombs, smoke, and flames rising high into the afternoon sky. A thorough check of my engine and pressure instruments

continued

ROE . . . Who Needs Them? continued

indicated all systems were normal. Additionally, my WSO could see no damage on the top of the jet.

I was scared by now. NO ONE could fly through the heart of a bomb fragmentation pattern at 300 feet AGL and escape without SOME damage. We climbed above 5,000 feet AGL and joined up with an F-15, who was nice enough to pull up on our wing after gunning our brains out. I sent him to the Nellis recovery frequency and asked for a very thorough belly check for battle damage.

After what seemed hours, he said there was no visible damage. We flew home on his wing just to be safe. A complete postflight inspection by both maintenance and the crew revealed we had escaped without a scratch!

I reported the incident to my squadron commander, who passed the information to the Green Flag staff.

The Results

The following lessons were learned from this unfortunate series of events:

- The F-16 flight lead had violated the ROE by contacting the crew of the ABCCC and getting the coordinates of the primary target prior to takeoff.
- The F-16s' primary target was the same as my secondary target. Although separated by time, the TOT windows allowed for both missions to be in the same target area at the same time.
- The F-16s arrived at their target approximately 30 seconds early and, rather than loiter in "enemy" territory for the period, decided to violate the ROE and attack the target early. Thirty seconds outside a TOT window doesn't seem like much, but it was almost the difference between life and death in this case.
- We arrived at our target with only 25 seconds remaining in our TOT window. We were "legal" but not by much. Give yourself a buffer between your TOT and the next. The other pilot may need it.
- Clear the target area for threats before attacking. We never saw the F-16s against the overcast sky of that afternoon. Their gray camouflage pattern worked as advertised. The F-16s saw us, but too late to recall their ordnance. We were able to watch the whole episode on the flight lead's head-up display (HUD) video. If either of us had truly done a good job of visually clearing, the odds are one of us would have seen the other and this event would have been avoided.

Conclusions

Sometimes at home station, but especially during exercises such as Red Flag, Green Flag, Maple Flag, etc., there is a temptation to do the new, the different, and the exciting. This can be expected considering the fact that flyers, in general, tend to be an aggressive and adventurous group. All flyers need to temper this adventurous spirit with the knowledge ROE are there for a reason. They are often there as a result of some lesson learned by another "adventurous" flyer.

To quote a famous old saying, "there are old pilots and there are bold pilots, but there are no old, bold pilots." Stay around to be an old pilot. Obey the ROE. ■

There I Was continued

1 o'clock." As we began our defensive actions, smoke salvos appeared on our right. We started to move back to a line abreast position on lead as he banked to the left.

Out of nowhere, a flash appeared below us, and we realized it was another attacker. I heard myself half yell "Holy ----, someone flew under us!" We knew that at our altitude, we missed the other guy by maybe 100 feet with a closure of over 1,000 knots. We told lead, and we all began to look for a wingman, but it became apparent the IFR conditions we thought we left upon entry were waiting just ahead in the hilly terrain of Cedar Pass.

I brought my attention back into the cockpit, and we armed up the terrain following radar. I checked my radar scope to ensure terrain clearance, and my pilot transitioned to instruments. Lead was doing the same. The visibility had gone to zero in this short time, and the DME on our air-to-air TACAN also read zero. In these conditions, we had little idea of lead's direction and concluded we had reached our saturation point, and it was time to get out.

Our climb began with my attention on the DME, which seemed to be decreasing, and the altimeter, which wouldn't increase fast enough. In the excitement, we almost forgot a critical step in the 111 during decelerating flight — moving the wings forward. Other 111s had been lost when this step was left out. Luckily, my pilot remembered to bring the wings forward as we leveled off still in the clouds. At the time, I was interested in results without caring much how they were accomplished.

Later, as we discussed those exciting 5 minutes, we agreed we had been lucky not to hit someone else and that a friendly airplane can be just as deadly as a missile or a bullet. Most importantly, we found out that in a deteriorating situation, the most essential thing you can do is stay in control of what you still have control over. ■

IFC APPROACH

By the USAF Instrument Flight Center, Randolph AFB, TX 78150-5001

The Weekend Cross-Country

MAJOR BRUCE GUNN
USAF Instrument Flight Center

■ This article is for all those pilots and associated aviators who feel (and justifiably so) that weekend cross-country flights are one of a flyer's basic rights protected under the "pursuit of happiness" clause of the constitution. The weekend cross-country is an Air Force institution and will hopefully remain as such as long as McDonalds® sells hamburgers. Unfortunately, every now and then an undesirable event occurs during a cross-country that gives the responsible aviator and his or her supervisors a few gray hairs.

These occasional incidents also give the money manipulators an excuse to wave their deficits and call for the demise or severe restriction of the flyer's legitimate need to roam the skies between Friday and Sunday afternoon. In an effort to minimize the risk of losing this bastion of freedom, let's examine some of the notorious cross-country events of the past and look at ways to keep them out of the future.

A Look at the Past

Several years ago, four eager young aviators grew tired of their bleak, dreary surroundings and decided to go to a sunny resort area for the weekend. As usual, all four airplanes were not ready for their Friday morning takeoff time so they had to delay it. The pilots weren't overly concerned about this delay because the weather forecast for their destination called for clear skies and greater than 3 miles visibility all day, and their crew rest extended late into the evening. The aircraft repairs took longer than anticipated, but they were finally ready to go around midafternoon. So the aircrews got a quick update of their weather briefing and NOTAMs and took off just in time to reach their destination prior to sunset.

The unforeseen delays had caused a few hectic moments prior to takeoff, but after they got airborne, everyone started to relax and enjoy the flight. The temperature at their destination was 20 degrees Fahrenheit higher than the temperature at their home base, the winds aloft were smooth, and even the air traffic controllers were sounding friendlier than usual. Visions of warm, sunny beaches gradually washed away the aircrew members' cares and left them smiling like Cheshire cats all the way to the initial approach fix (IAF).

That's when their troubles began. Suddenly, the visibility was at precision radar approach (PAR) minimums, and the controllers were saying a couple of transient aircraft had already gone missed approach.

continued

IFC Approach — The Weekend Cross-Country continued

All of the other airfields in the area were also reporting poor visibility. Since the original forecast had not called for an alternate, the flight lead had not chosen one, nor did he have the fuel for one.

He decided to shoot an approach to see if he could acquire the runway, then call for his wingmen once he was on the ground. Unfortunately, during his approach, the visibility went well below PAR minimums so he went missed approach, climbed back up to the initial approach fix to rejoin his flight, and began an earnest search for an airfield which could accommodate four thirsty aircraft.

A suitable airfield was soon identified, but the flight would have to penetrate restricted airspace to reach it. Recognizing the gravity of the situation, the flight lead did not hesitate to declare an emergency and set a course direct to the new destination. It turned out they didn't have enough fuel to reach that airfield, but the winged gods smiled briefly upon them and allowed them to find another airfield which suited their purposes, even if it also was in a restricted area. So because of a few "bad breaks," the first leg of the "relaxing" weekend cross-country ended with nighttime approaches in heavy rain to an unbriefed and unplanned airfield, followed by a barrage of embarrassing questions.

The investigation that followed cleared the aircrews, weather forecasters, and air traffic controllers of any willful violation of rules or regulations. However, some commonsense rules were clearly breached, and as a result, the associated MAJCOM found it necessary to stipulate a new requirement for aircrews to designate an alternate airfield on *every* cross-country flight.

Contributory Factors

Was it really just a few "bad breaks" that put four pilots and their aircraft in peril? If it was, I wouldn't be writing this article and you wouldn't be reading it. The truth is there were some major contributory factors that set this whole affair into motion.

- The first factor was a weatherman (aren't they always the culprits?) who read all of his charts and instruments correctly but thought the seasonal fog and haze, which were notorious in his particular area, were not worth mentioning in the forecast.
- The second factor was a flight lead who was so intent on getting away from it all that he ignored his mentors' teachings about a "hip pocket" alternate. In the words of a certain credit card company, he should never have left home without it.
- The third, fourth, and fifth factors were the three wingmen who never questioned the weather or need for an alternate. Their silence was probably based on the belief that casting stones of ruination at a weekend cross-country was not only unthinkable, it was unforgiv-

able. Rumor had it that offenders were often scorned, and their names were secretly sent to stan/eval as possible candidates for no-notice check rides.

These wingmen obviously believed the rumors because the weather went unquestioned during the initial weather briefing, a rebriefing, a flight briefing, and a 2-hour, high altitude cruise en route to the IAF! In short, they goofed. They strayed from some of the unwritten rules of cross-country flying, and they paid an unsavory price for it. To prevent others from paying the same or higher price, these rules follow.

Cross-Country Rules

■ Rule 1. Don't trust the weather. Most weathermen can be trusted, but they are only as good as the facilities or data they employ. Weather, on the other hand, can never be trusted. One of Murphy's major aims in his immortal life is to wreak havoc with the forces of nature and make weathermen look like liars and aircrews look unprepared. So far, Murphy has been fairly successful.

■ Rule 2. Plan your cross-country around your fuel — not in spite of it. Fuel, not weather, is the leading determinant of where a cross-country will end. Weather is merely the catalyst that forces fuel into the limelight. Until the engineers design an aircraft with unlimited fuel stores, we will have to live with this restriction, so we might as well abide by its terms. Those who choose to downplay the importance of fuel are merely inviting Murphy into their parlor for a round of high stakes betting.

Five years after the aforementioned incident, six intrepid young aviators decided to go to the same destination. They were starting from a different base of origin so they had enough fuel for the MAJCOM-mandated alternate. The weather was forecast to be near their personal weather category minimums with intermittent conditions below their minimums. But, by using MAJCOM-approved dual alternates, they were able to keep their cross-country plans alive.

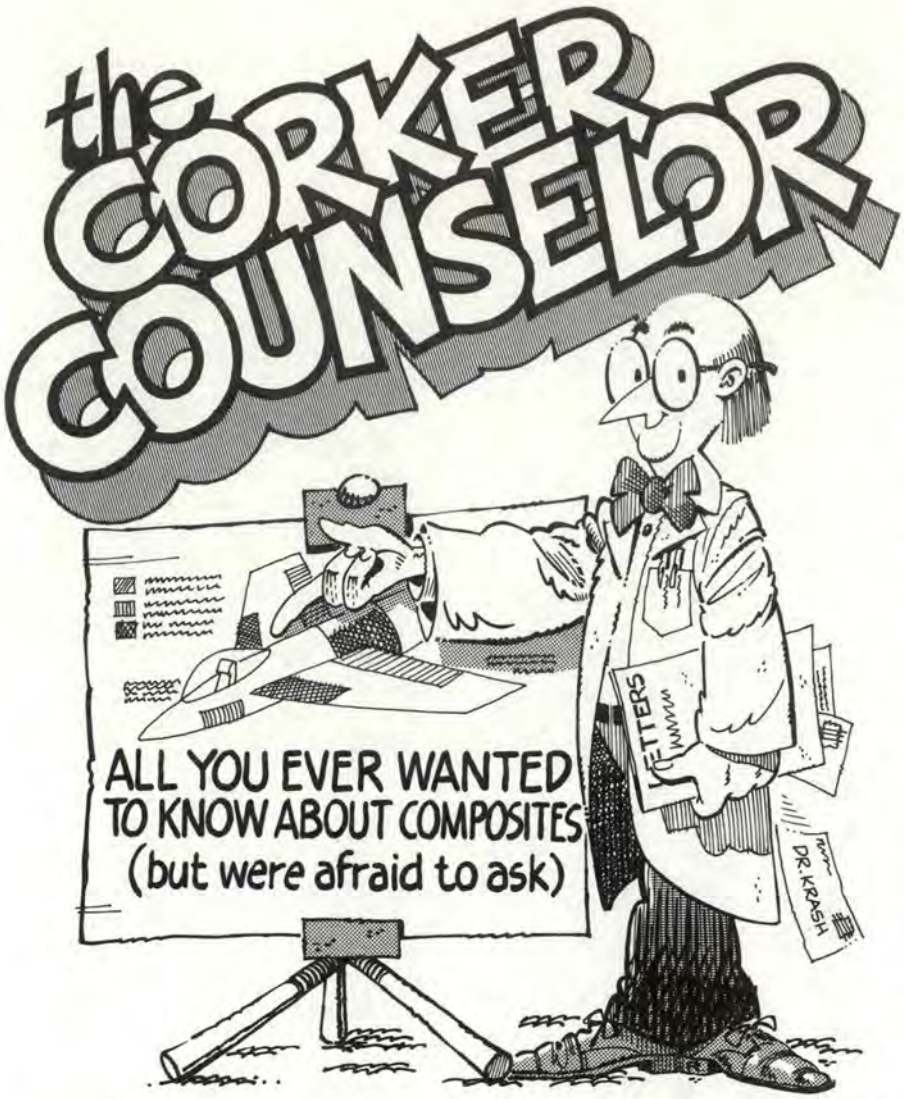
No one was surprised when four of the six airplanes diverted to their preplanned alternates. But, the aircrews themselves said their eyes were opened and sufficiently watered when they had to divert in deteriorating weather conditions to aerodromes with marginal weather and early closure times. Once again, a simple cross-country had turned into an unpleasant ordeal.

■ Rule 3. Be flexible when planning the stopover points or destination on a cross-country. The nonnegotiable demand to go to one and only one spot on earth has as much potential for creating trouble as the proverbial "get-home-itis."

■ Rule 4. Use common sense. If the tiny little voice in your mind is yelling big words of warning, it's time to step back and take an emotionless, Mr. Spock-type approach to the situation. Little voices are seldom wrong.

Application

These four basic rules are guaranteed to work for any aircraft in any command. They aren't new and revolutionary and they won't necessarily make your cross-country a relaxing, carefree vacation, but they can keep it from turning into a white-knuckled, bullet-sweating nightmare. ■



JOSEPH F. TILSON
AFISC
System Safety and Engineering Division

■ We have all heard many superstitions which keep resurfacing in spite of all efforts to dispel them. One subject which is heavily endowed with these gems is the hazards associated with mishaps involving carbon fiber composite materials (Corker mishaps). We have enlisted Dr. Will Krash, Chief of our Counseling Department, to assist us in dealing with this wealth of misinformation. Dr. Krash has offered to use a representative sample of his daily correspondence to make his point.

The Concerns

Dear Dr. Krash,

I am an aircraft maintenance specialist. I work around aircraft that have parts of their structure made of advanced composite material. Everyone knows that if this material is involved in a crash and fire, it becomes very dangerous to people and property. My sergeant even told me about the time two F-15s burned and caused the loss of electrical power at an Air Force base. Another friend of mine heard you can get cancer from working around it. What I need to know is, "Will being around this stuff cause my hair to fall out?"

Bothered in Bitburg

The Truth

Dear Bothered,

Not if you were bald to start with. The hazards associated with the breaking and burning of advanced composites are probably more misunderstood than the stork and the Easter Bunny.

A composite is a material composed of different substances. Fiberglass is a good example of a composite. It is composed of layers of glass cloth bonded together with intermediate layers of epoxy resin.

The term *advanced* composite is usually used when referring to the graphite/epoxy or boron/epoxy material. These materials are composed of graphite cloth or boron cloth bonded together with epoxy resin.

The term *advanced* is used because the structural properties, such as stiffness and tensile strength, are more like those of high-strength metals. If you see a material that looks like fiberglass but is black, it is most likely boron/epoxy or graphite/epoxy.

The original concern about these materials arose when it was discovered that if graphite/epoxy (carbon fiber) was burned and agitated, it broke into very tiny (3 to 4 millimeters long) single-fiber particles which were highly conductive electrically. A typical smoke cloud from such a situation could be filled with millions of these particles. There was concern that if these particles settled into electrical or electronic equipment, it would cause electrical shorting. It was also noted that people developed minor irritating rashes if large concentrations of these particles came in contact with their skin.

Several years and millions of test dollars later, the problem was brought into clear perspective among the engineers and scientists. The problem is not the serious hazard that was first perceived. The effects we see with these materials are no more than we can produce with many other materials that have been around for years.

If a joker puts a handful of human hair clippings down your shirt, you stand a good chance of developing an irritating rash. If you walk through a pile of metal shavings, you are likely to develop a rash or a few severe sores from imbedded tiny splinters. Mine workers, machinists, spray painters, and sand blaster operators wear face masks to avoid inhaling large quantities of tiny solid particles into their lungs.

Two Concerns

The subject can be thought of in two parts, carbon fiber and boron fiber. Boron fiber poses only one concern. This is to people who allow the broken fiber ends to come directly into contact with their bare skin. When boron fiber breaks, each individual fiber forms a very sharp edge which can enter the pores of the skin, break off, and cause the same type of irritation as any tiny metal sliver. The solution is to handle broken fibers with gloves and avoid walking through burned or damaged debris.

Carbon fiber is a little different. Because the fibers are so very small (1/10 the diameter of boron fiber) and light, they can be stirred up into a dust cloud and either inhaled by people or carried by the wind to areas where they might cause problems.

"Then why do they have these fancy *sniffers* to test for carbon fibers?" you ask. The sniffer is only a small portable vacuum cleaner with an electronic grid in the flowstream. The grid counts *any conductive particle* that passes it and gives the user an estimate of the concentration of almost invisible particles present so he or she has an idea where and how much to clean up.

What You Always Wanted to Know . . .

A cryptic list of things you always wanted to know but were afraid to ask follows. This list is not complete in itself and should not be used in place of established regulations and procedures. It is intended as a guide to assist you in knowing where to look.

- A videotape, entitled "Mishaps Involving Carbon Fibers," has been produced. This may be obtained from your audiovisual libraries under the file identification SAVPIN 052734VC3/4 or TS-1495.
- There is also a guide entitled "Revised HAVE NAME Protection Manual." This tells you how to clean up a carbon fiber mishap and has been distributed to all MAJCOM safety offices.
- Sniffers have been placed at:

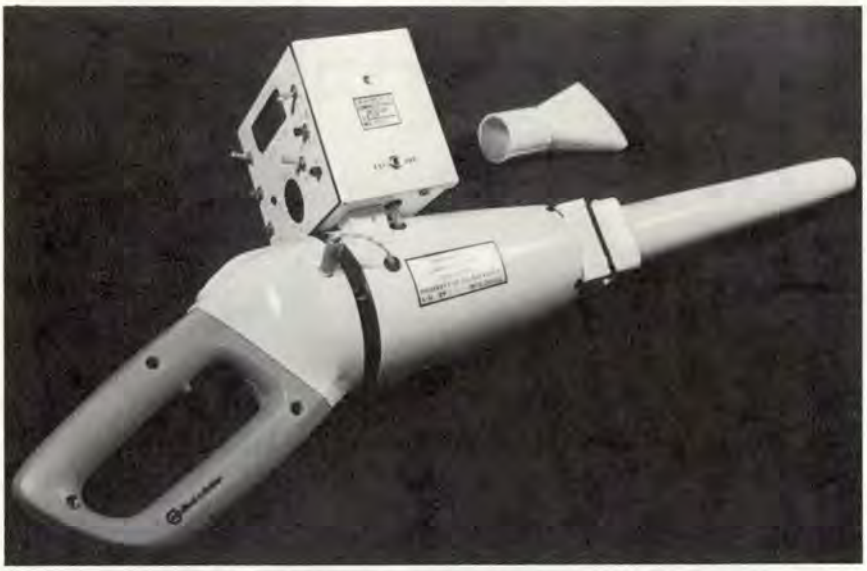
49 TFW, Holloman AFB NM
388 TFW, Hill AFB UT
1 TFW, Langley AFB VA
33 TFW, Eglin AFB FL
HQ USAFE, Ramstein AB GE
9 TFS, Shaw AFB SC
12 TRS, Bergstrom AFB TX
HQ AFISC, Norton AFB CA
MITRE Corp, Bedford MA
RADC, Griffiss AFB NY

- AFR 127-4 special reporting instructions regarding carbon fiber mishaps have been deleted because the potential problem no longer merits such attention.
- Carbon fiber orientation training is provided in the following AFISC courses:

Flight Safety Officer (FSO) Course

Aircraft Mishap Investigation Course (AMIC)

Aircraft Mishap Board President's Course



This *sniffer* measures airborne conductive particles as the air is drawn across an electronic grid in the flowstream. It was designed to detect carbon fibers.

Dealing With Composites

In general, the fiction about the hazards of composites has been exposed for what it is. The material is not something to significantly alter our normal mishap response. Like many other substances in the mishap debris, it is to be understood and dealt with accordingly.

It is not poisonous, but avoid stirring up and breathing dust clouds of it. As a matter of routine, it will always be advisable to spray the broken and burned composite fiber portions with any tacky substance (lacquer, paint, oil, AFFF firefighting foam) that will stick the fibers in place until they can be cleaned up. In the final cleanup, the broken and burned graphite/epoxy portions of the wreckage should be wrapped and sealed (tape is fine) in plastic and disposed of (preferably buried) where they will not be exposed to the atmosphere. You don't dump waste fuels and propellants where they can become a problem later, and you don't put graphite/epoxy fibers where they can become a problem later either. Simple, isn't it?

Returning to the last two points in our "Bothered in Bitburg" letter, be advised that neither of the two F-15s involved in the before-mentioned incident contained a single ounce of carbon fiber (their speed brakes were aluminum at the time). And extensive testing has not produced any evidence that a cancer risk exists. However, it is difficult to assess the long term risk of ingesting these particles into the lungs, so avoid inhaling these solid particles. In conclusion, properly handled carbon fiber materials pose far less risk to people and equipment than was originally thought, and the AFR 127-4 guidance was revised accordingly in 1983.

Sincerely,
Will Krash ■

OFF-STATION TRAINING

LIEUTENANT MARK L. PUGNALE
Flying Safety Officer
Minot AFB, ND

■ A B-52 crew was scheduled for an off-station training sortie. The home station had deployed maintenance personnel since the landing base was not familiar with B-52 aircraft. After the aircraft landed, the maintenance crew completed the postflight and necessary maintenance on the aircraft.

Problems

The following day, they refueled the aircraft for its return flight home. After refueling was completed, fuel began to vent overboard from the right external fuel tank. The maintenance crew transferred 100 pounds from the external tank to relieve the pressure and were successful in stopping the fuel venting.

Later that day, the Command Post contacted the aircraft commander and informed him of a major fuel spill from his airplane. The fire department was notified of the fuel spill. The aircraft commander quickly responded with part of his crew, but was unable to contact the maintenance team. When the crew arrived at the aircraft, the odor of JP-4 was very strong. The fire department had hosed down the area on the right side of the aircraft and left.

Solution

The crew examined the right side of the aircraft. They determined the external tank had vented fuel, and the fire department had installed a rubber plug in the surge vent on the external tank pylon (mistake #1). To prevent more fuel from venting overboard, the plug was left in the vent (mistake #2). The pilot directed the copilot to put power on the aircraft, take a fuel reading, and then transfer fuel from the external into a main tank.

After the fuel transfer was started, a crewmember heard a strange noise coming from around the right external fuel tank. As he approached the tank, he saw it had collapsed. The crewmember immediately informed the pilot who directed the copilot to stop the transfer of fuel and to remove power from the aircraft. The crew inspected the external tank where it had collapsed, forward of the boost pump and aft of the nose cone.

They decided to pull the plug from the surge vent and continue the fuel transfer, draining the tank to 500 pounds of fuel. The fire department was called again and the area cleaned up. The next day the external tank was replaced, and the flight home was uneventful.

Lessons Learned

B-52 crews, know your strange field procedures and your exterior inspection checklist. When performing work on your aircraft, always have your maintenance team available. Be sure you know how to contact them so they will be available. ■

FSO'S CORNER

Is Anyone Listening?

MAJOR RAYOLYN L. McKELVY
42d Bombardment Wing
Loring AFB, ME

■ I'm sure every FSO has asked that question before. Usually when halfway through a well planned briefing and suddenly realizing the noise he or she hears is someone snoring. It's a legitimate question for us to ask. Is anyone listening? How do we know if our message was received?

Usually our first clue is when an inspector asks a few questions about hazard reports and no one seems to know any answers! ("We just talked about hazard reports at our last meeting.") As a result, most of us safety officers become angry, sulk, and try harder to prepare our next briefing. However, trying harder may not resolve the problem.

The real problem may not lie with us, the briefers, but rather with the audience. Communication researchers have shown that most people listen at only about 25 percent efficiency. That means we all forget three-quarters of what we hear. Even with extensive training and practice, few people exceed the 70-percent efficiency level. We have to accept the fact people will forget a good part of what we say. There are, however, other factors we, as briefers, should be aware of.

Motives and emotions play a large part in the listener's readiness and willingness to listen. If listeners have other things on their minds (such as a pending mission), they probably won't be ready to listen to "another safety pitch." Scheduling safety meetings not to interfere with mission planning, crew rest, or other activities can help make the audience more receptive to the message.

Another obstacle we face is trying to fulfill audience expectations. Each member of an audience brings to each safety meeting a certain set of expectations. It's been my experience that most of them want to hear the details of a catastrophic mishap, but not for too long. They don't want to hear about a mechanical failure and an uneventful recovery, no matter how important the lesson to be learned.

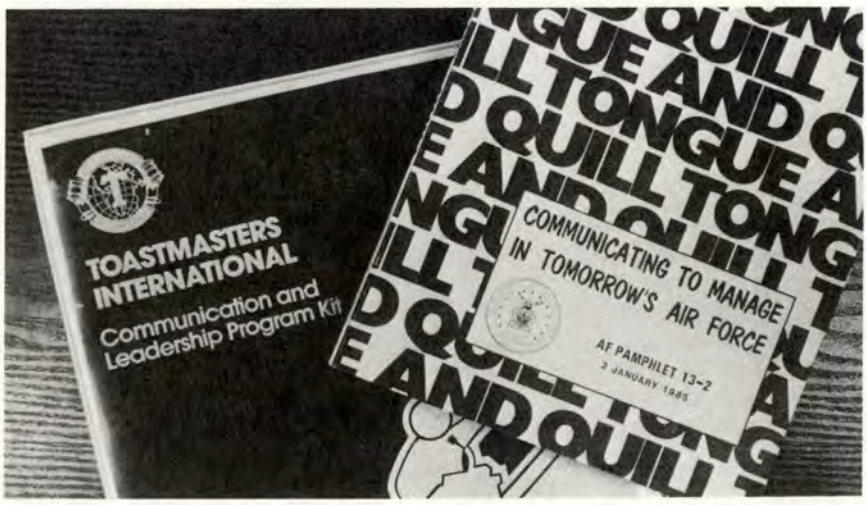
The audience expects the FSO to give them some specific moral for each incident briefed, to be dynamic, and to be a great storyteller. The best meetings usually result when someone can relate the reported incident to something they experienced personally.

College public speaking texts advise that audience analysis is the key to a successful speech. To keep the attention of any audience, you must fulfill their expectations — give them what they want. Merely reading message reports with all the technical jargon is deadly. Instead, give a synopsis that's lively, concise, and directed to the listeners.

Some proven techniques for keeping audience attention include using humor, relating new concepts to something familiar, using movement and activity, employing suspense, creating conflict, exaggerating reality, and hitting close to home (called the vital).

Using these factors of attention can be a positive addition to your safety meetings. Check out a speech textbook at your local library or education office. Look through the *Tongue and Quill* and other sources for ideas on how to give better briefings. Try to dry-run your briefing with someone else to critique you. A little extra effort on your part can pay big dividends. It might even keep them listening.

What are you doing in your safety program that could help other FSOs if they knew about it? Call me (Dale Pierce) at AUTOVON 579-7450, or send your name, AUTOVON number, and program idea to 919 SOG/SEF, Eglin AFB Aux Fld 3, Florida 32542-6005. ■



A successful safety meeting depends on more than just knowing your material. You must understand and use effective communication techniques.

COL GRANT B. McNAUGHTON
Directorate of Medical Inspection

■ The illusion of a false horizon, or false depiction of the horizontal, has always been a significant contributor to aircraft mishaps. Relatively recent research has shown why this can happen.

Processing Visual Information

The eye has two modes of processing visual information. The *focal* mode focuses, reads the 20/20 line and the instruments, identifies the target, and positions the ordnance. The *ambient* mode orients you to the outside or "ambient" environment.

These two modes are relatively independent — and have substantial differences. The focal mode is highly discriminatory and is exclusively visual. In fact, it is limited to the central 1 to 2 degrees of the retina. The focal mode also requires good lighting and good resolution, and typically involves conscious attention.

The ambient mode, on the other hand, is not discriminatory at all. The ambient mode is concerned not with object recognition, but with object quality, or more correctly, the quality of the surroundings. For example, the "wallness" of a wall, "surfaceness" of a surface, "horizoness" of a horizon, or "cockpitness" of an aircraft. Being more of a quality assessment mode than a recognition mode, it is basically uncritical and can therefore be easily deceived, which is a potentially serious problem.

Although ambient mode processing involves the entire retina, including central vision, it is by no means exclusively visual. In fact, it is hard-wired to the same terminals in the brain that subserve the organs of balance, proprioception (seat-of-the-pants and body position sensation), and to some extent, hearing.

In that sense, instead of an ambient visual system, we have, in effect, an ambient orientation system into which visual inputs are correlated with inputs from the other senses. The proportion of orientation inputs from vision is probably 90 percent or more, and of that, the contribution of the ambient mode is 90 percent or more. In other words, the lion's share of orientation information comes via the ambient visual mode.

Orientation Tests

A simple test, popularized by Dr. Richard Malcolm, a Canadian neurophysiologist, quickly demonstrates the orienting power of the ambient mode. Stand with your feet in a heel-to-toe tandem position and close one eye. Over the open eye, place your fist leaving an aperture for central (focal mode) vision, but snug to the sides to block peripheral inputs, and see how long you can maintain your balance.

Now try the converse of that test by clenching your fist in the same way, but hold it an inch or two away from your eye to permit peripheral inputs. You should find it easier to hold your balance with the latter position, because orientation cues are going directly to your ambient mode, which is your primary orientation sensor.

Another simple proof is to stand on one leg, tying the shoelace on the opposite foot. You'll find that if you fix your gaze on one point, you'll have little difficulty maintaining balance. However, if you look

about, you'll likely lose your balance. Why? Your eye movements have scrambled orientation inputs into your ambient mode.

The Ambient Mode

Whereas the focal mode requires good lighting and good optics and typically involves conscious attention, the ambient mode does not. The ambient mode is what we use to orient in the dark. (Though you can't read in a darkened room, you can orient, if there's a little bit of light. And it doesn't take much; just the crack in the doorway will suffice.) Resolution is totally unimportant — you can orient with 20 diopter coke bottles before your eyes. Finally, the ambient mode evolved earlier and operates on more of a subconscious or reflex level.

A potentially hazardous consequence of ambient mode function involves driving a car at night. You can steer by your ambient mode, and as long as you can see well enough to steer, you maintain great confidence in your ability to drive. So you commonly tend to drive as fast at night as you do during the daytime, not always making allowance for the fact that your focal mode, which is your hazard recognition mode, has been selectively degraded.

Hence, you fail to see the animals, pot holes, obstructions, curves, and joggers in time. That, coupled with the fact that your reflexes are slower at the lower light levels, contributes to the disproportionately higher mishap rate in night driving.

Pilots and the Ambient Mode

There are several consequences of ambient mode reactions of importance to pilots: The distraction potential, the sensation of self-motion (vection illusion), and the tendency to align to false horizons. Though all are important, this article will address the last.

Of some interest, in this connection, is the fact that the portion of the brain subserving ambient vision contains receptors that are specifically tuned to lines, and to edges. At least this is so in cats and monkeys, and is most likely so in humans, too. Since the human cannot tolerate a sense of disorientation, and since the ambient mode is uncritical, it will likely accept anything with the quality of "horizoness" or of "surfaceness" as a valid horizon or surface.

This underlies the commanding nature of sloping cloud decks, sloping terrain, a haze or fog-depressed horizon, the northern lights, surface features resembling a horizon, or peculiar weather phenomena resembling a horizon or displaced surface.

Lighting Illusions

A particularly lethal combination involves a night takeoff across a lighted shoreline. Since the balance organ cannot distinguish between acceleration and a climb, as the shoreline passes beneath the wing line, the pilot becomes convinced the aircraft is doing a loop, and tends to dump the nose and fly into the water.

- There have been other instances where surface lights have caused confusion. One instance involved a flight of F-15s at dusk in conditions of reduced visibility. As they crossed an isolated highway, several flight members felt they must be doing a loop and questioned lead about his power setting.
- Another instance involved a single F-16 on a night descent through a cloud deck onto the range. The pilot was only in the cloud deck from 11,000 to 9,000 feet — not very long, but long enough

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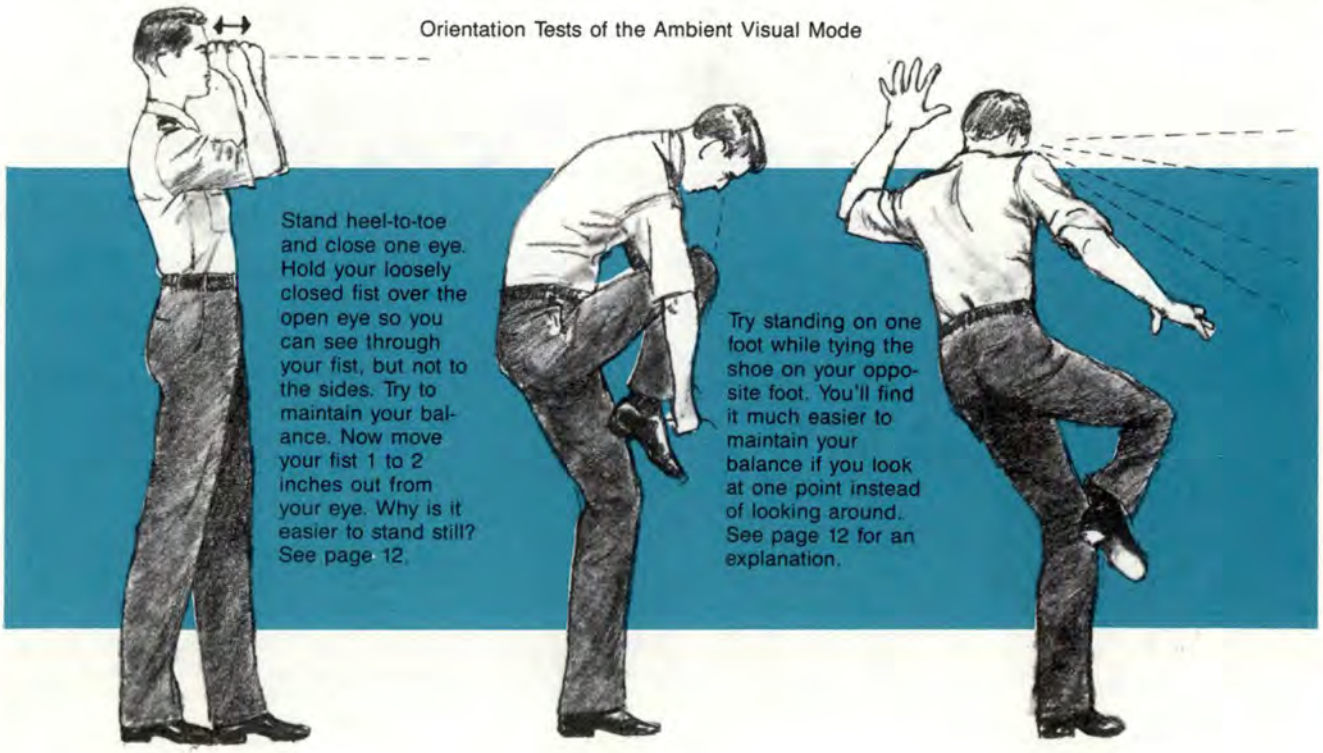


False Horizons

continued

for his balance organ to register straight and level. So when he leveled at 8,000 feet, his ear indicated a climb — "pure vertical." On the surface below, an isolated highway crossed his flightpath, and car lights reflecting off the forward upper portion of his canopy made it appear he was in a significant dive.

His eyes said "dive" yet his ears said "climb." This experienced fighter pilot became so confused he seriously considered ejecting. What saved him was his training. He went head down on the ADI, forcing it to indicate straight and level until the lights of a large city appeared on the horizon, at which point the illusion vanished.

Other Illusions

Less fortunate have been several pilots of single seat fighters for whom the illusion of a false horizon or surface was sufficiently convincing or commanding that they apparently failed to cross-check their instruments (or failed to believe them if they did).

- One of these was Number 3 in a 3-ship formation to the range. The lead element, Numbers 1 and 2, ran into heavy weather and aborted by executing a 180 degree turn. Number 3, who was trailing by several miles, also made a 180 degree turn, going head-down on his TACAN and radar scope to track the leaders. Meanwhile, he engaged altitude hold on his autopilot, but reduced power below that necessary to maintain altitude.

The aircraft entered a descent, unnoticed by the pilot, losing 3,800 feet in less than a minute and impacted the surface of a large lake. There were sloping cloud decks paralleling the route of flight, and it was thought these clouds might have provided the pilot's ambient mode the comforting illusion of straight and level flight, while his focal mode was channelized on his navigation devices.

- Another instance involved the lead of a 2-ship formation on a night bomb drop. (See Figure 1.) The sun had set and from their orbit altitude, over 2 miles above the range, they could see, to the west, in succession:
  - The rapidly blackening sky,
  - white clouds,
  - black mountains,
  - light flat terrain,
  - dark irregular discontinuities in the surface, and
  - more light terrain surrounding the target.

During the prolonged descent to pickle altitude, lead's balance organs had time to acclimate, register-

Figure 1

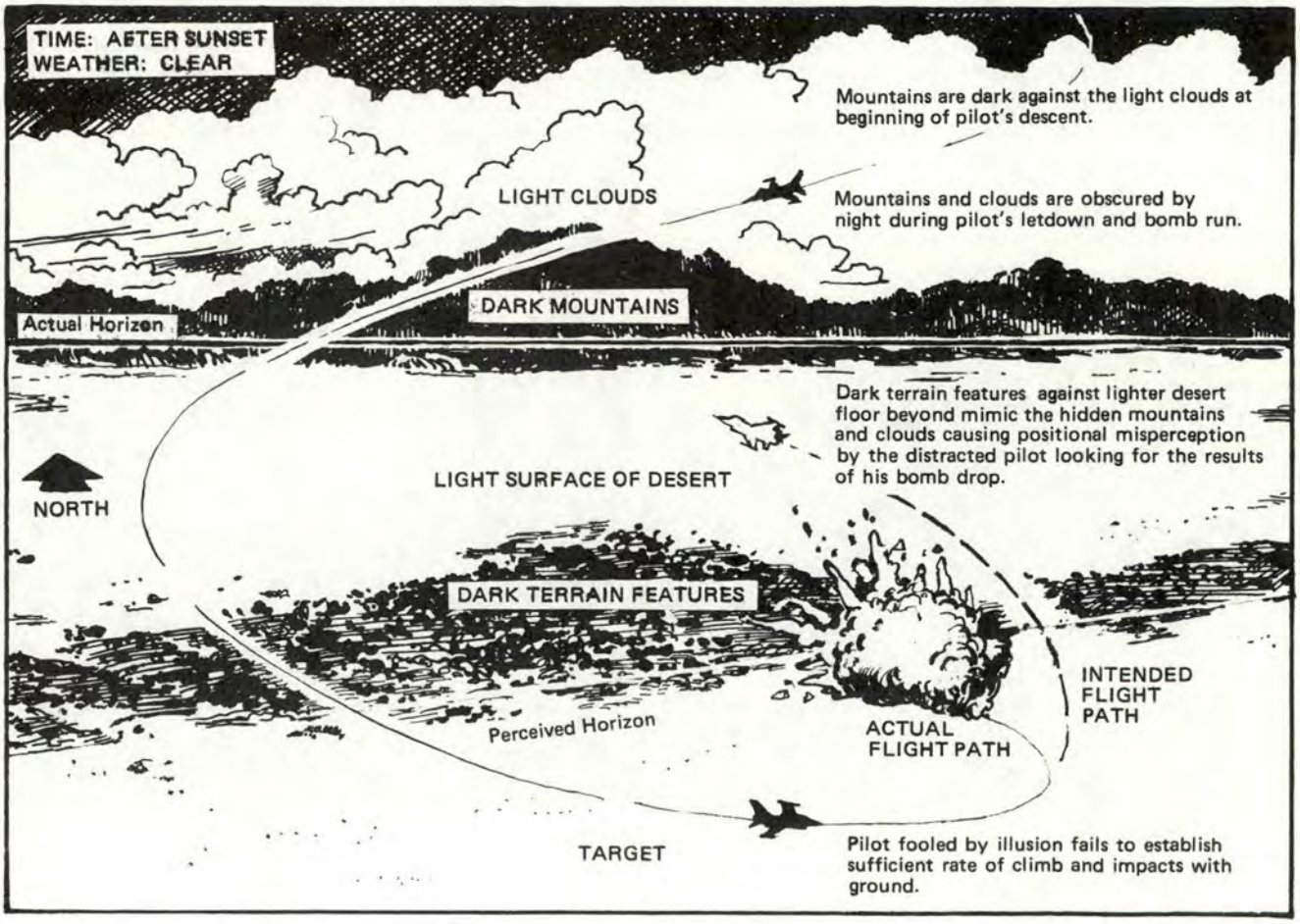


Figure 2

ing straight and level, such that when he leveled to pickle, his ear indicated a climb.

In want of better information, the tendency would be to continue the descent. Visually, as long as he was inbound to the target, the lights of a large city to the east helped maintain orientation. As soon as he pickled, lead started a turn to the west, intending to climb to downwind. At this point, 2 miles below his orbit altitude, the western sky was now black. The clouds and mountains both blended with the sky, the light terrain resembled the clouds, the dark surface discontinuities resembled the mountains, and the nearby light terrain resembled that in the distance.

The net effect was to displace the perceived horizon downward 35 to 40 degrees. Two additional factors affected this pilot. First, the bomb failed to spot, and troubleshooting this "no-spot" trapped his attention. And second, he was dropping that bomb about his normal bedtime, so he probably was not as sharp as usual.

These factors, coupled with his falsely corroborating vestibular and ambient mode visual cues, provided the comforting premise of a climbing turn to downwind, as intended, and he never bothered to cross-check his instruments, crashing before completing the turn.

A Lethal Combination

■ The last involved a pilot on a night weather precision radar approach (PAR). (See Figure 2.) The weather on this particular evening created unusual lighting effects. It magnified the intensity of runway approach lights, as well as the glow from the air base complex; and it produced bright double reflections of the sequenced strobes "like lights going up a hill" at an angle away from the actual strobes. These false strobes were fixed in space and were sufficiently bright to be seen for miles.

There was a solid overcast from 3,000 feet to 400 feet AGL, but the base of the 400 foot deck had ragged undulations extending down to a 200-foot broken deck. On the surface below 10 to 12 feet AGL, it was crystal clear — you could "see to China." However, above that was mist sufficient to create halos around lights. The area around the approach end of the runway was described as being like a bubble, lit like an amusement park at night — very unusual.

The pilot flew a tight PAR until about 1-⅓ miles out. At that point, he abruptly went well below glide slope and impacted before the controller could complete missed approach instructions. The aircraft struck the surface in a nose-down attitude at 112-degrees right bank.

Apparently, at about Decision Height, ambient conditions created an illusion of surface ahead and to the left, and of sky lower and farther to the right. Displacement of the false repeater strobes to his right may have further reinforced the illusion that the runway was well to his right. This must have been sufficiently commanding that when the pilot reached Decision Height and looked up, or looked up upon breaking out into the bright glare, he rolled to align himself with what he was convinced was the horizontal.

In all three of the last examples, the pilots were experienced, and all three held positions of responsibility within their units.

The Solution

So, how do you prevent such mishaps? First, be aware of the tricks your ambient visual mode can play on you. Second, develop a sound composite instrument cross-check. And last, discipline yourself to continue that cross-check whenever ambient conditions dictate, regardless of distractions or fatigue. ■

I Need a Vacation!

PEGGY E. HODGE
Assistant Editor

■ Some leave! I took 2 weeks off — so, for 3 weeks in advance of my leave, I had to double up on my paperwork, plus jump ahead on the work that would need handling while I was gone. In addition to the paperwork, I wanted to fly a few more sorties, and I had a lot of errands to run before I left. In general, I was harried and preoccupied.

My vacation was all traveling — driving 8 to 10 hours a day, visiting friends and relatives, sleeping in strange beds, eating strange foods, and handling a host of strange new problems. We had all sorts of car troubles, the kids got carsick, I smashed my finger fixing a flat, and we ran out of money a thousand miles from home.

We had to drive straight through to make it home late the night before I was due back to work. The house was a mess, the car was a wreck, the dog tore up my prize rose bushes, the phone had been shut off because we forgot to mail the check before we left, and I'm covered with heat rash from head to toe.

Now, I am back at work. I have an 0600 show time for a mission and a critical conference to plan. I am looking at the paper stacked up in my in-basket, juggling four short suspense, action-required items, looking at notes from the "old man," gulping massive doses of coffee to try to get my eyes open and blood circulating, rubbing half my blistered body with sunburn cream, and trying to get some sort of grasp on the workload I'll need to handle to get back in step.

And, all the while, I'm sitting here thinking, what I really need is a vacation from my vacation.

I think you've got the picture. How many times have you heard vacation horror stories from friends and associates? A recurring theme in vacation horror stories is the very real, arch enemy — fatigue.

So, now that summer is under way, and you're planning your leave time, let's look at the problems associated with fatigue and some good countermeasures.

Fatigue

Fatigue is reported as either a suspected or definite contributing factor in approximately 10 percent of all USAF Class A mishaps. There are some who believe the true figure is actually much higher and that fatigue is underrecognized, underreported, and underadmitted.

There are two broad categories of fatigue: Acute or short-term, and chronic or long-term.

■ *Acute or Short-Term Fatigue* Acute fatigue is a short-lived common occurrence. Some causes of acute fatigue include inadequate rest, mild hypoxia (oxygen deficiency), physical stress (pulling Gs is

Every so often the vacation bug hits us, and we have to take off and get away from the old rat race. But the vacation bug often has a stinger of its own.

very fatiguing), psychological stress, and circadian rhythm upsets that interfere with sleep (time zone change).

■ *Chronic or Long-Term Fatigue* Persistent fatigue results from long workdays, chronic sleeping difficulties, or lack of exercise. A common source of chronic fatigue for crewmembers is the long duty day/long work week.

The Hazards

Fatigue is hazardous for a number of reasons. It produces carelessness, forgetfulness, sloppiness, slowed reactions, inappropriate reactions, irritability, disinterest, and the loss of timing involved in performing tasks.

Fatigue also erodes judgment and causes disorders of attention — distractions, channelized attention, and inattention. It can produce subtle erosion of performance along with an inability to recognize it, plus an unwillingness to do anything constructive about it. In short, fatigue is a bad actor — one which deserves our attention.

Countermeasures

Being aware and recognizing the problem is the first step in prevention. Face the fact that a problem exists which may adversely affect your performance.

Countermeasures to avoid the effects of either acute or chronic fatigue include proper diet, hydration, adequate rest and sleep, physical conditioning, and the common sense to stay on the ground until your alertness and energy are restored.

If you know you face a heavy schedule upon your return to work, come back a day early. Also, prioritize your tasks both before and after you leave so you don't place unnecessary demands on yourself!

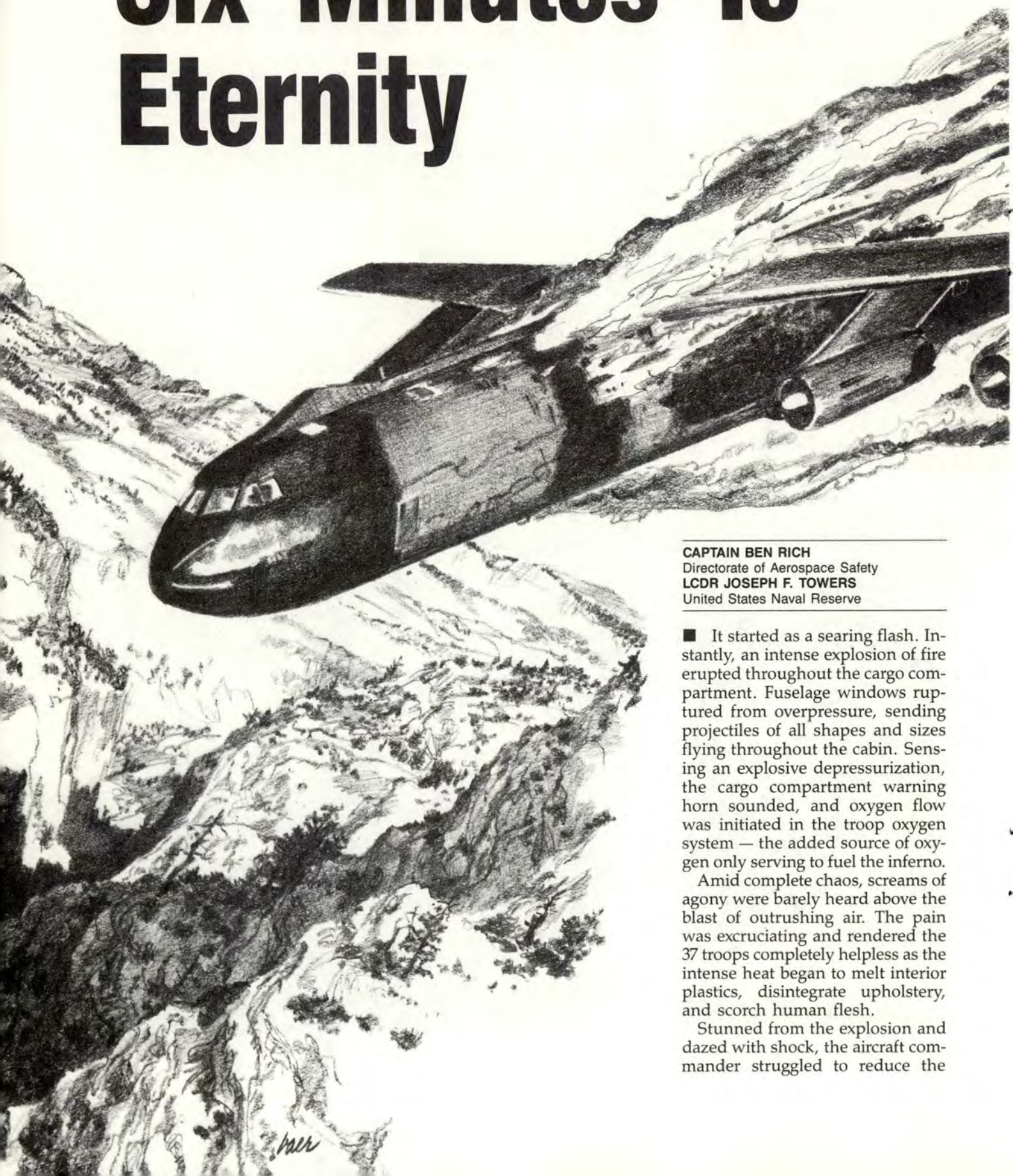
Only the crewmember knows how tired he or she is. Like hypoxia, we all have our own symptoms for fatigue. We must know these indications and be willing to exert additional effort to overcome their effects.

Fatigue is an individual and subjective phenomenon. Ultimately, the responsibility for minimizing fatigue and maintaining maximum performance rests with each individual.

Have a good leave and fly smart! ■

"After vacation, I was trying very hard to get back into the swing of things at work — doing the best I could to juggle suspenses and plan for a mission — all in a fatigued state." It's very important to recognize the problem of fatigue and its hazards.

Six Minutes To Eternity



CAPTAIN BEN RICH
Directorate of Aerospace Safety
LCDR JOSEPH F. TOWERS
United States Naval Reserve

■ It started as a searing flash. Instantly, an intense explosion of fire erupted throughout the cargo compartment. Fuselage windows ruptured from overpressure, sending projectiles of all shapes and sizes flying throughout the cabin. Sensing an explosive depressurization, the cargo compartment warning horn sounded, and oxygen flow was initiated in the troop oxygen system — the added source of oxygen only serving to fuel the inferno.

Amid complete chaos, screams of agony were barely heard above the blast of outrushing air. The pain was excruciating and rendered the 37 troops completely helpless as the intense heat began to melt interior plastics, disintegrate upholstery, and scorch human flesh.

Stunned from the explosion and dazed with shock, the aircraft commander struggled to reduce the

throttles as his nomex flight suit began to char in the intense heat and his skin melted, exposing nerve endings. Acute impulses of pain streaked throughout his body. Meanwhile, the over-speed warning began to shriek as the stricken Starlifter accelerated toward its maximum design speed and the ground below.

Without reason, the landing gear extended, and the gear doors were immediately torn off by the airstream. The pilot pulled for his life on the yoke in a last, desperate attempt to regain control.

The Aftermath

The shocking reality of the smoldering C-141 hulk was difficult to accept. There it was, the U.S. Air Force's first Class A mishap of the year, a sobering wreck in the far corner of a freshly plowed field. The main fuselage had ruptured in several sections with the flightdeck completely obliterated, virtually compressed against the upward slope of an irrigation canal. There were gaping holes along the entire stretch of the upper fuselage with sections of aluminum structure having disintegrated from the intense heat. Amid the now gutted interior, the stench of burned flesh was overwhelming.

The death toll was too grim to think about. Thirty-seven U.S. Army troops and six crewmembers, all dead and now badly burned beyond recognition — except one. A lone survivor had miraculously escaped from the wreckage and now lay in a coma. Perhaps he would hold some clue.

The Investigation

Postflight analyses of the cockpit voice and flight data recorders were uneventful — except for the last 6 minutes of flight. The aircraft was climbing to cruise altitude when there was some garbled talk of leaking cargo from one of the pallets and a request for the no-smoking light.

The lone survivor had stated that he noticed fumes, similar to paint thinner, as he went forward to the lavatory. Shortly after closing the door, a loud explosion occurred, followed by intense heat. Fearful for his life, he had crouched down gasping for fresh air coming from the air conditioning outlet. That's all he could remember prior to regaining consciousness in the hospital.

A statement from one of the troops who had the good fortune of traveling on another aircraft indicated he had helped pack a 5-gallon container of acetone on one of the pallets, along with a spare NICAD battery and a box of day/night flares.

The Regulation

AFR 71-4, Preparation of Hazardous Materials for Military Air Shipment, contains the following information:

"Acetone is classified as a flammable liquid that must be stored in a cool, well-ventilated area and properly packaged in a container that is tightly closed to prevent evaporation. As such, it must not be stored near sources of heat, flames, sparks, combustible materials, or oxidizing agents. (A flammable liquid is any liquid having a flash point below 100 degrees Fahrenheit capable of giving off a vapor in sufficient concentration to form an ignitable mixture with the air near the surface of the liquid.) Furthermore, acetone is identified as a "single-daggered" item which requires *operational necessity approval* and must be transported on *cargo-only aircraft. Passengers are not permitted.*

Electrical storage batteries containing electrolyte acid or alkaline corrosive battery fluid must be completely protected so that short circuits will be prevented and must not be packed with other articles."

All such materials listed in AFR 71-4 must be packed, inspected, and certified safe for air shipment. Furthermore, a red-labeled DD Form 1387-2 (special handling and certification form for hazardous cargo) must be attached when required. This certification must be signed by a formally qualified person with the

continued

Six Minutes To Eternity continued

flight crew making the final determination of acceptance. A review of the required papers at the originating air terminal revealed no such records were on file.

The Report

Applicable excerpts from the mishap investigation report follow:

"The cause of this mishap was the inflight ignition of volatile fluid or vapors that were emitted from an improperly packaged and leaking drum of acetone that never should have been transported. The ensuing explosion and fire quickly engulfed the aircraft interior and rendered both passengers and crew entirely helpless to combat such an inferno . . . Although the exact source of ignition is unknown, it is assumed to have originated from an adjacent NICAD battery, contact with electrical wiring under the flooring, or a source of flame from the passenger smoking section . . . Further investigation revealed the acetone had pooled in the cargo rollers which ran from pallet positions 6 through 13, and apparently had started to saturate segments of the underfloor area prior to ignition . . . Impact forces of the crash landing were within human tolerances, but incapacitation or death precluded any type of evacuation.

". . . This is a particularly tragic mishap since it could have been prevented had prescribed regulations simply been adhered to. Furthermore, had the cargo processing personnel applied basic common sense and elementary supervision, this catastrophic loss of 43 lives and a valuable aircraft could have been avoided."

The Frustration

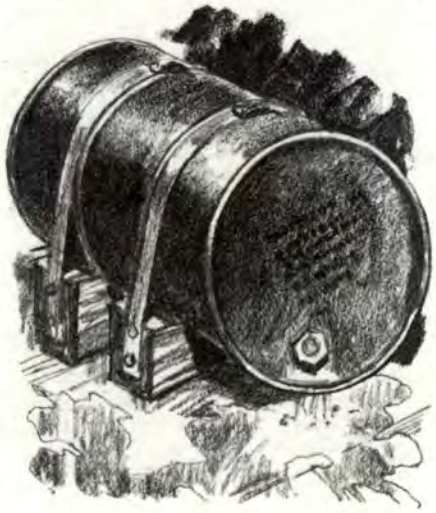
Later, at an impromptu aircrew meeting, an obviously distraught and fanatical safety officer just couldn't hold back anymore.

"It was by far the most horrible thing I've ever seen. Charred figures slumped over in their seats. Near-shapeless forms clumped together around the emergency exits. My primary duty is to prevent this kind of thing, not investigate it. I must not be doing my job right. This absolutely senseless, careless, and ignorant act will now be long remembered as one of the single worst aircraft disasters in Air Force aviation history. And it was so avoidable.

"Doesn't anyone out there read all those safety reports on hazardous cargo? Or have there been so many, all those bright red flags waving in the breeze, that we've all become insensitive to the obvious? This falls into the rationalization that safety is paramount — until it interferes with operational necessity. No sooner do we begin to educate one base than the same stuff shows up on the next flight. And all that business about commitment and mission requirements . . . That's great, but there's a right way to deploy the gear or pick it up at the destination site.

"And as for those reps that sign and certify that no such hazardous cargo has been packed, they're just going through the motions. They really don't know what they have. Batteries, flares, explosives, corrosive and flammable fluids, fully inflated tires, unpurged engines and servicing units, and compressed gases. It goes on and on.

"When are people going to stop trying to sneak stuff through — don't they realize they're endangering themselves? After all, everybody flies on a C-141 some time or another. The whole system of checks and balances just broke down. We really blew it. And even worse, we should have seen such a thing coming."



The Reality

Obviously, the scenario you've just read is fictitious, but could have occurred no less than 16 times in 1986. On 16 occasions last year, Military Airlift Command crews flying C-130s, C-141s, and C-5s were faced with cargo leaks of various forms while airborne, and crews were forced to declare emergencies and make unscheduled landings 50 percent of the time.

Of even greater concern is the number of occurrences of cargo mishandling which go unreported, or were discovered by alert crewmembers and handled prior to takeoff. On one occasion, a C-141 crew receiving a 4-pallet train consisting of helicopter blades, a submarine periscope, and assorted equipment was briefed that the load contained no hazardous materials, and documentation didn't include DD Forms 1387-2 as required by AFR 71-4. A very alert loadmaster discovered a 500-gallon aircraft fuel tank that had been neither drained nor purged buried deep in the train.

On a continental U.S. exercise deposition, another C-141 was forced to divert en route because of fumes originating from a paint can stored in a tool box on a personal possession pallet. An overseas C-5 mission was forced to land because fuel fumes were coming from the wing of a naval bomber which was neither drained nor purged.

Other sources of leaks and fumes included aircraft engines, drones, power units, helicopters, and on two occasions, fumes from cans punctured by forklifts during loading.

The potential of this problem must be emphasized, and it will take the total efforts of aircrews and ground personnel to solve this problem before the fiction becomes reality. ■

SURVIVING AIRCRAFT EMERGENCIES

MAJOR RAY GORDON
Directorate of Aerospace Safety

■ Ever wonder how you or your passengers would respond in an actual emergency egress involving fire? It's not pleasant to think about, but the reality is that when a fire occurs during a survivable crash, people die because they aren't prepared to save their own lives.

Most people have a largely unfounded fatalistic attitude about aircraft mishaps. The fact is, passengers and crews of large transport aircraft have a 90 percent chance of survival if there is *no fire*. However, those chances go below 60 percent if a fire is present. Even though only 5 to 18 percent of all airline mishaps have an associated fire, 65 percent of all fatalities occur in those mishaps. People *can* survive if they are adequately prepared — if they have a plan.

Recently, the FAA and the Air Force have focused more attention on crash survival. The FAA has strengthened standards for flammability of cabin materials and added requirements for floor proximity egress lighting systems. The Air Force has procured improved quick-don oxygen masks, smoke goggles, and escape hoods, and has validated smoke elimination procedures through in-flight tests in several aircraft.

While all of these actions contribute to the safety of the crew and their passengers, one of the most important areas has not been adequately addressed — egress training. To help safety officers "get the word out" to potential passengers and crews in their units, the Air Force produced the new videotape, "Surviving Aircraft Emergencies" (604080DF). Many audiovisual libraries should already have their copy. We encourage safety officers to give this information the widest dissemination possible. (More information on cabin fires can be found in "Cabin Fires," *Flying Safety* magazine, January 1986.) ■

COMPLACENCY

Recipe For Disaster

CAPTAIN BEN RICH
Directorate of Aerospace Safety

■ During a recent observation ride on a C-9A aeromedical evacuation mission, I observed two incidents which reminded me of a near mishap that occurred 8 years prior. At the originating station, the copilot put the clearance "on request to Nellis" AFB. The clearance delivery specialist replied that "Air-evac 444 was cleared to Las Vegas via . . . ." The copilot caught the error and confirmed the destination as Nellis AFB (KSLV), not Las Vegas (KLAS).

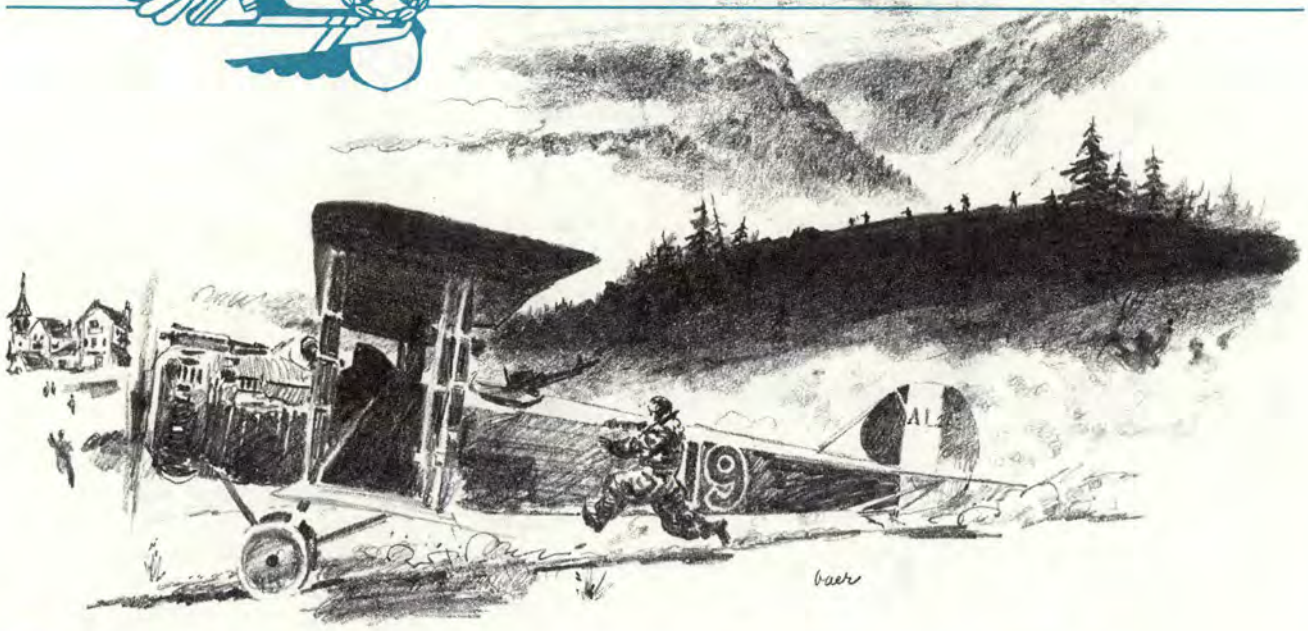
At the third intermediate stop, clearance was once again requested, this time to "March AFB." Our clearance was issued "to Riverside" and again, the copilot was forced to clutter up the frequency confirming the destination was indeed March AFB (KRIV), not Riverside Municipal (KRAL).

In both cases, the clearance issued included a valid navigational aid (VORs in both cases) and an active civilian airport. Had the crews not questioned the routing and included the amended fixes into their flight plans, their route of flight would not have correlated with the route expected by air traffic control.

This type of incident occurred in 1978 when a complacent controller at a southeastern fighter base cleared an F-4 to Greensboro instead of Goldsboro. The controller was not familiar with the identification GSD and, rather than take the time to be sure, he shot from the hip and cleared the aircraft to a fix within the vicinity. The result was a conflict with a commercial Boeing 727 who was also planning to overfly Greensboro.

CHS is really Charleston and Hickam is coincidental with Honolulu, but ADW is *not* Washington, LUF is *not* Phoenix, and BIG is *not* El Paso. Complacency can be the recipe for disaster. ■

Safety Warrior



Never A Discouraging Word

LT COL JIMMIE D. MARTIN
Editor

■ U.S. Army Aviation lagged far behind the rest of the world in terms of money spent for aircraft development. In our last installment on the Mexican Punitive Expedition, we saw how inadequate our aircraft were for the assigned task. By the time we entered World War I in April 1918, things had not changed much. General Pershing stated that of the 55 aircraft (all trainers) possessed by the Aviation Section, 51 were obsolete and 4 were obsolescent.

However, our aircrews were eager and were constantly pushing the limits to advance airpower. They could see some of the potential that existed even though most of the nonflying hierarchy could not. This month, we take a look at the actions of one crew stationed in France during World War I. In speaking of this crew (especially the pilot), the following phrase seems to fit: "If it wasn't for bad luck, we'd have no luck at all." The information was taken from an official report printed in *The U.S. Air Service in World War I*, published by the Office of Air Force History.

A Routine (?) Mission

First Lieutenant Thomas J.D. Fuller, Jr., pilot, and Second Lieutenant Virgil Brookhart, observer, both of the 135th Aero Squadron, took off from their airfield near Toul, France, on the morning of 12 September 1918, to observe artillery fire near Montsec.

Their first problem was the weather. It was described as "quite unfavorable owing to low hanging fog, and the southwest wind."

They began their flight at 1,500 feet but soon ran into heavy clouds. After flying east for about 5 minutes, "they became temporarily swallowed up in the clouds. By chasing holes in the clouds, they managed to catch glimpses of the various towns over which they were passing. Although this presented some difficulties since it was their first flight together over the lines, they identified Nancy, and then found themselves over Thiaucort (West)." The crew decided to abort the mission and fly to Ourchess airdrome which was southwest of their position.

Heading for Home

The crew climbed to 10,000 feet and headed southwest. After about half an hour, they let down below the clouds and found themselves over a range of mountains which they later discovered was near Mulhausen. As they got closer to the ground, they could see trenches, so they climbed back up and continued southwest (or so they believed).

Some time later, they once again let down below the clouds and found themselves over the front line trenches. "It became apparent to them that a fairly strong wind was blowing them off their intended course." Since the wind was from the west and they had been heading southwest, they concluded the wind was pushing them southeast toward Switzerland.

When they let down below the clouds the next time, they found they had left the trenches behind, so they landed. They decided this wasn't the right move when soldiers

and peasants appeared from all directions. They also realized the country around them looked unfamiliar.

So, they made an immediate takeoff. Unfortunately, their engine failed and they were forced to land again. The most likely cause of the failure was a bullet in the engine since the soldiers had started shooting at them as they took off.

What Now?

The fliers soon found out they had been unlucky enough to land in one of the areas where Switzerland projects into French territory and were only about 600 meters outside France. If it had not been for the lucky (or unlucky, depending on your viewpoint) bullet hit in their engine, they could easily have made it back to France.

The two men were taken into custody by the Swiss authorities and transported to Lucerne. There they were informed of their rights. They had two choices. They could be put on parole and remain free in Switzerland, or they could go to prison. Either way, they would remain in the country for the rest of the war. After all their efforts to avoid being captured by the enemy, they ended up being interred in Switzerland.

Both men were unhappy with the situation. They knew if they accepted parole, they wouldn't be able to escape because the U.S. Government would be obligated to return them to Switzerland if they broke their leave of honor. Consequently, they decided to take their chances on escaping from prison. If they were successful, they would be allowed to remain free.

The Plan

They came up with a plan. Lt Brookhart would initially accept parole and would live at the hotel in Lucerne. This would give him freedom of movement, and he would be able to learn the area and pick up information that might help them later. Meanwhile, Lt Fuller would go to the military prison at Andermatt near the St. Gotthard Tunnel.

Lt Fuller would study the prison and come up with an escape plan. He would send his plans in code by letter to Lt Brookhart. Lt Brookhart would then choose to go to prison, and they would escape together.

But by the time Lt Fuller was able to come up with a good escape plan, the situation had changed. Everyone was anticipating an Armistice in the very near future. Lt Brookhart apparently had come up with a plan of his own that didn't include prison, because he never communicated with Lt Fuller.

Over the Wall

Anxious to get on with his escape, Lt Fuller decided to go alone. He was housed on the fourth floor of the prison near a toilet with a window opening on the outside of the prison. Whenever he visited the toilet, he was always accompanied by a guard who waited outside the door. Lt Fuller gradually increased the time he spent in the toilet each night so the guard would not get suspicious too quickly on the night of his escape.

He chose a dark, foggy night in early November to make his break. He cut up his bedsheet and made a rope which he wrapped around his waist under his pajamas. He

continued

Safety Warrior

Never A Discouraging Word continued

then asked to go to the toilet. Once inside, he tied one end of his bedsheet rope to the window sill, tied the other end around his waist, and started to let himself down just as the guard knocked on the door.

Everything was going according to plan until he reached the third floor and Lady Luck dealt him another blow. His improvised rope broke, and he fell 30 feet to the ground below. His face was severely cut, and he was knocked unconscious by the fall.

Fortunately, Lt Fuller regained consciousness before being discovered, and despite his injuries, followed his preplanned escape route to the tunnel. By moving carefully, he successfully avoided the two sentries at the tunnel entrance and made his way into the tunnel. He then discovered he had lost the candle and matches he had planned to use to find his way through the heavy fog.

With freedom near, his luck once again ran true to form, and he emerged from the tunnel right between two sentries. They quickly apprehended him, and Lt Fuller soon found himself back in the hands of the Swiss authorities.

A New Plan?

He was confined to bed for more than a week while recuperating from the injuries he suffered in the fall. He was then released after the Armistice was signed.

The report concludes with the following:

"Lieutenants Fuller and Brookhart told substantially the same story of their experience up to the point where they separated. From that point on, Lieutenant Brookhart remained on parole at Lucerne, and of this period had little to say."

I don't know what happened to Lt Fuller after that, but I hope his luck changed for the better. I'm sure he continued with the same never-give-up spirit that exemplifies the military aviator to this day. ■

Maintenance Superstars

MAJOR KEVIN SULLIVAN
HQ USAF
Directorate of Maintenance and Supply

■ One of the most competitive and prestigious award programs in the Air Force is the Maintenance Awards Program prescribed by AFR 900-46. Comprised of three award categories — the Daedalian Maintenance Award, Air Force Maintenance Effectiveness Awards, and Outstanding Maintenance Personnel Awards — the Air Force maintenance recognition program promotes active competition among approximately 200,000 active duty, Air National Guard, and Air Force Reserve personnel. At stake — 28 personnel and 13 unit awards.

Needless to say, competition in each of the award categories is always tough, and selection to receive either a personnel or unit award is a great honor. Nominations for personnel awards are due to the Air Staff by 15 November of each year, and nominations for the unit awards are due by 15 December. However, the selection process actually begins much earlier. The nomination packages are prepared at the unit and forwarded through a gauntlet of selection boards at various intermediate headquarters, before each MAJCOM selects the one nomination in each category to forward for Air Staff evaluation.

Once the Air Staff receives the nominations, they are subjected to additional selection board scrutiny to identify further the "best of the best." In the case of the Daedalian Maintenance Award, the selection process also includes an on-site visit to the four top contenders by a team of evaluators led by the Director of Maintenance and Supply. Award winners are normally announced in the February-March timeframe by the Director of Maintenance and Supply for the Maintenance Personnel and Effectiveness Awards and by the Chief of Staff for the Daedalian Award.

This year's winners represent the pride of the Air Force's maintenance community. Representing 13 major commands, the personnel and units selected to receive 1986 maintenance awards have survived a selection process which involves hundreds of nominees and several levels of evaluation. Our sincere congratulations to the 1986 maintenance superstars! ■

DAEDALIAN MAINTENANCE AWARD

Winner: **50 TFW, Hahn AB GE**

Runners Up*: **101 ARW • Bangor ANG Base ME**
33 TFW • Eglin AFB FL
47 FTW • Laughlin AFB TX

* listed alphabetically

AIR FORCE MAINTENANCE EFFECTIVENESS AWARDS

• *Organizational Maintenance Squadron*	**416 OMS**	Griffiss AFB NY (SAC)
• *Field Maintenance Squadron*	**380 FMS**	Plattsburgh AFB NY (SAC)
• *Avionics Maintenance Squadron*	**436 AMS and 512 AMS (Associate)**	Dover AFB DE (MAC)
• *Aircraft Generation Squadron*	**33 AGS**	Eglin AFB FL (TAC)
• *Equipment Maintenance Squadron*	**18 EMS**	Kadena AB JA (PACAF)
• *Component Repair Squadron*	**81 CRS**	RAF Bentwaters UK (USAFE)
• *Consolidated Aircraft Maintenance Activity*	**4507 CAMS**	Shaw AFB SC (TAC)
• *Munitions Maintenance Squadron*	**3246 MMS**	Eglin AFB FL (AFSC)
• *Ground Launched Missile Maintenance Squadron*	**487 TMMS**	Comiso Air Station IT (USAFE)
• *Depot Maintenance*	**ALC**	Hill AFB UT (AFLC)
• *Large Communications-Electronics Maintenance Activity*	**1972 CG**	Eglin AFB FL (AFCC)
• *Small Communications-Electronics Maintenance Activity*	**631 TCF**	Wurzburg GE (USAFE)

OUTSTANDING MAINTENANCE PERSONNEL AWARDS

	AIRCRAFT MAINTENANCE	COMMUNICATIONS-ELECTRONICS
Field Grade Manager	**Lt Col Paul W. Dilling SAC**	**Major Ann M. Testa AFCC**
Company Grade Manager	**Capt Kent A. Mueller MAC**	**Capt Kenneth R. Neuhaus ESC**
Supervisor-Manager	**MSgt Kurt D. Dreibelbis MAC**	**SMSgt Robert E. Johnson AFSPACECOM**
Technician-Supervisor	**TSgt Eric E. Paad AAC**	**TSgt David G. Hess AFSPACECOM**
Technician	**Sgt Annette K. Smith AAC**	**SrAmn Jesse L. Martin ESC**
Civilian Manager	**Mr Don H. Delk AAC**	**Mr Tataye Nagami AFCC**
Civilian Technician	**Mr Timothy A. Conte TAC**	**Mr Quitman D. Byrd AFCC**

	MISSILE MAINTENANCE	MUNITIONS MAINTENANCE
Field Grade Manager	**Lt Col Gordon F. Boswell SAC**	**Maj Thomas M. Belisle TAC**
Company Grade Manager	**Capt Michael W. Arnold USAFE**	**Capt Karen L. Thompson USAFE**
Supervisor-Manager	**SMSgt Roger L. Stivison SAC**	**SMSgt John S. Cecere AFLC**
Technician-Supervisor	**TSgt Karl O. Chavous USAFE**	**SSgt James E. Bellnier USAFE**
Technician	**Sgt Randolph M. Simpson USAFE**	**SrAmn Allen M. Roussin AFLC**
Civilian Manager	**Mr James K. Walker AFLC**	**Mr Carl J. Winston AFSC**
Civilian Technician	**Ms Carmen G. Roggenkamp USAFE**	**Mr Peter R. Lopez TAC**

tech topics

FOD FEEDERS

■ Flightline organizations are usually very conscientious about their foreign object damage (FOD) programs. We have daily ramp checks, sweeper support, and various other devices and programs designed to prevent engine damage. But sometimes, in the interest of expediency, an unsafe procedure will creep into our operations.

Ingestion of foreign objects such as headsets, communication cords, aircraft seat covers, and even game darts, continues to make up a large percentage of all FOD mishaps reported. Since these are occurring with alarming frequency, a few are worth addressing.

Headset

During a night troubleshooting operation of an afterburner (AB) fuel flow fluctuation on an F-111E, the ground observer was monitoring the right engine for leaks. As the engine operator in the cockpit reduced power from AB to military for the cooling down period, the ground observer became distracted by blinking headlights from a truck located on the opposite side of the plane. Thinking the truck was signaling him, the observer crouched down beneath the right engine, approximately 3 to 4 feet aft of the blow-in doors. Upon crouching down, his securely fastened communication headset was sucked from his head through the blow-in door and into the right engine causing extensive damage totaling $42,636.

This unit submitted an AFTO Form 22 regarding the danger areas near the engine intakes at a high thrust setting, and is placing more emphasis in all maintenance training on the danger of the F-111 aircraft engine blow-in doors and intakes.

Communication Cord

During a hot (engines running) preflight of an F-15C that was positioned in a hardened aircraft shelter, the crew chief disconnected his headset from the communication cord and walked to the line truck to request a specialist. Upon returning to the aircraft, he was shocked to see the cord rising off the ground and up into the left engine intake. A followup borescope revealed $18,155 in damage to the four air-oil coolers, the fan module, and the core module.

Personnel in this unit were instructed to wrap the communication cord around the forward ejector foot when missiles are not loaded, or to take the cord around the main landing gear when missiles are loaded.

Seat Cover

As the pilots of an A-10 four-ship approached the end-of-runway (EOR) inspection with their canopies open, one of them heard a loud bang accompanied by a yawing sensation. Thinking he had taxied over something or blown a tire, the pilot stopped his aircraft to visually inspect his main gear. Then a wingman informed him of smoke and debris exiting the right engine. The EOR crew quickly chocked the mishap aircraft while the pilot shut down the engines.

Sometime prior to the attempted sortie, a crew chief rolled up the large, vinyl seat cover used for the ejection seat into a neat 8-inch long cylindrical shape. During previous maintenance on the ejection seat, the cover was probably moved out of the way and ended up behind the seat where it was not readily visible.

Since the crew chief and pilot performed their preflight before sunrise with a flashlight, both failed to notice the dark green seat cover rolled up in the dark cockpit. During taxi out to the runway with the canopy open, the seat cover was dislodged and ingested by the right engine.

Perhaps ejection seat covers should be a color that can be easily seen. Since not all of them are, all of us need to remember that seat covers, intake covers, water intrusion and other plugs, can cause damage if ingested and therefore, should be treated like lost tools if misplaced.

Game Darts

After completing a 400-hour borescope inspection on the right engine of an F-111F, a supervisor and two workers performed an intake and surrounding area FOD inspection and found everything in order except for a field jacket hanging on an inboard pylon. One of the workers grabbed the jacket but it slipped from his hands and fell to the ground. Although he picked up the jacket, neither the worker nor his team members noticed a set of darts fall from the jacket breast pocket.

It wasn't until after the engine run-up that a post-operation inspection of the engine intake/exhaust areas revealed $51,500 in FOD damage. Investigators found pieces of steel and feathers from the ingested darts.

The reports keep coming in and costs keep adding up. In our daily routine of activities, we can become complacent or easily distracted by other activities around us. Think about these FOD mishaps the next time you're working around operating jet engines. ■

OPS TOPICS

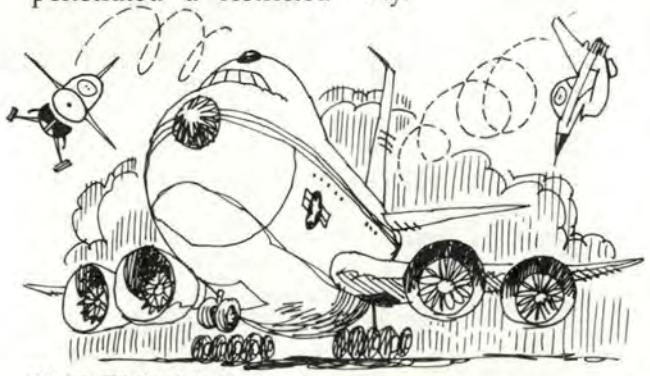
Lost Again?

An Air Force transport aircraft was being flown via low altitude airways. The en route low altitude chart showed the outbound course from an intermediate station to be 148 degrees. The actual course was 184 degrees.

The crew was unaware of the error and intercepted and flew the incorrect course. As a result, they penetrated a restricted area and were vectored out of it by the center.

They were using the correct chart but had failed to see a notice posted in base operations advising of the mistake. The error was also listed in the Class II NOTAMs, but the crew didn't check them.

Remember to check all pertinent information before flight. An undetected error in your inflight pubs could ruin your whole day.



Wake Turbulence

Two four-ship flights of F-16s deployed cross country. At their destination, they recovered by an overhead pattern to the left runway. Pattern spacing was normal.

About 30 seconds before the last F-16 touched down, an E-3A landed on the right runway. As the last F-16 rounded out for landing, it encountered wake turbulence. The pilot initiated a Mil power go-around but the electric jet dropped in on the right gear and bounced back into the air.

The pilot flew a closed pattern to a full stop landing. After reaching the chocks, he found damage to the right stabilator, right speedbrake, and right ventral fin.

The winds at the time of the mishap were from 20 degrees right of runway heading at 5 knots — perfect conditions for wake turbulence on the runway. All the other F-16s had encountered light turbulence on landing. However, the E-3A landing generated enough turbulence to cause some loss of control for the last F-16.

Be aware of the conditions that lead to encountering wake turbulence. The only way to handle wake turbulence is to *avoid it*. Allow enough time for it to dissipate before landing or taking off.

Runway in Sight

The following story is true. Only the names have been changed. It begins on a hazy, Friday afternoon.

After having been cleared for an opposite-direction visual approach to runway 31 at "Valley" AFB, two T-38 pilots aboard Bozo 55 mistakenly lined up with runway 30 at "Nearby" airport. The Valley approach controller told Bozo 55 "Valley AFB is 12 o'clock and 8 miles." The pilot of Bozo 55 replied he had the field in sight. What the pilots actually saw was Nearby airport.

Moments later, the Valley controller noticed Bozo 55 was aligned with the runway at Nearby. The controller issued a traffic advisory on conflicting VFR traffic departing Nearby airport and instructed Bozo 55 to immediately turn and climb to reintercept the final approach course into Valley. At approximately 500 feet AGL, Bozo 55 and a Cessna 172 passed each other. The Cessna pilot contacted the Valley controller and questioned him about the T-38.

This incident would not have happened if the two

continued

T-38 pilots had properly prepared themselves for this flight during mission planning. Also because they were anxious to land before sunset, the pilots deviated from normal procedures and requested an opposite-direction visual approach from their position SW of the base.

On final approach, the pilots saw an airport they believed was the base. Had they properly monitored their instruments and known the airfield layout, they never would have deviated from their initial inbound heading.

The controller's instruction that the base was " . . . 12 o'clock and 8 miles" was a useful cue they ignored. Rather than take time to verify the field they saw was the right one, they reacted. The runway was closer than expected, so they had to make a rapid descent from 3,000 feet MSL to under 1,000 feet MSL in less than 10 seconds, and alter heading to line up with runway 30 at Nearby Airport.

The moral of this story is to thoroughly mission plan and don't jump to conclusions. Use all available cues.

Capt G. David Hernandez
Flying Safety Officer
Castle AFB, CA

FOD Ejection

The backseater (WSO) of an F-4F was ejected as he opened the rear canopy after flight. The pilot remained in the aircraft and was uninjured. The inadvertent ejection was caused by a foreign object — a box the WSO had stowed in his navigator bag before flight.

During the air combat mission, the box came out of the bag and slipped between the canopy activating mechanism and the ejection seat. To prevent similar mishaps, account for all loose articles before opening your canopy. If you have lost something, leave the canopy closed until you have someone visually check your banana link area. Also check your Dash One warnings.

Flight safety information of the GAF translated by Lt Col Horst Kronenwett, GAF

MAIL CALL

EDITOR
FLYING SAFETY MAGAZINE
AFISC/SEPP
NORTON AFB, CA 92409-7001

All Dash Ones Are Not Created Equal

■ I really enjoy reading your magazine as I find most of the articles very informative and interesting. Recently, I was reading the January 1987, volume 43, number 1 edition and came upon the article, "All Dash Ones Are Not Created Equal," by Capt Robert R. Singleton. It was very well written and covered a subject that is near and dear to me, the accuracy of weather forecasts. I have been a weather forecaster for 13 years and have run into all of the vexations outlined in the article. There are a couple of points in the article which I feel require clarification or expansion.

a. Page 20, column 3, last paragraph — It is stated that TAFs are generated hourly and special as required. Air Weather Service (AWS) units normally file TAFs every 6 hours and amend them as required by changing weather conditions. The actual file times for each station are covered in the various Weather Wing supplements to AWSR 105-27. Some stations might have a file time of 0200Z plus every 6 hours (PE6HRS) while other stations might have 1700Z PE6HRS. Each hour might have a weather station issuing a forecast but not all stations will for that hour.

b. Page 22, column 3, next to the last paragraph — It states "help the weather folks help us." Amen to that. I can't remember the number of times that I have had to brief a crew into an area that was going to have questionable weather, either on arrival or en route, and couldn't locate PIREPS in the area even though I knew that flight operations were going on there. Pilots must remember that the information relayed to a weather station isn't just filed away; it is put into the Automated Weather Network for many people to use. What it boils down to is that the information relayed to us might be the difference in conducting safe flight operations or encountering that dread of all pilots, inadvertent IMC.

c. Page 22, column 3, last paragraph — Predicting the weather is a tough job and forecasters do try to do the best with available data and assets. There are a lot of people in the field that work many hours at varied tasks to get the weather forecasts ready for any given day's flying. We'll brief you on what we think is there, but it's up to you, the customer, to provide feedback. If you're not satisfied with the product, we can't improve it if we don't know about any problems. AWS takes pride in putting out a good product and wants to keep the customers happy.

Thanks for the chance to make an input, and keep up the good work.

Frank D. Lawson, Jr., MSgt, USAF
Weather Forecaster
Det 2, 20WS/CC

Thanks for your kind letter and for the additional information. As you and Capt Singleton both have pointed out, there must be two-way communication between the weather forecasters and aircrews. ■

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UNITED STATES AIR FORCE

Well Done Award

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outstanding airmanship

and professional

performance during

a hazardous situation

and for a

significant contribution

to the

United States Air Force

Mishap Prevention

Program.

CAPTAIN

Jonathan D. George

9th Strategic Reconnaissance Wing
Beale Air Force Base, California

■ On 24 May 1986, Captain George took off from an overseas location on his first U-2 operational reconnaissance mission. Everything was normal for the first 3 hours. Suddenly, with the aircraft cruising above 60,000 feet, the autopilot disconnected, and the pitch trim ran full nose down. The aircraft pitched over and exceeded the maximum allowable Mach limit, entering an aerodynamic regime from which few U-2s have ever been recovered.

Captain George immediately grabbed the yoke, somehow pulled the aircraft out of its steep, nose-down attitude, and began attempts to correct the situation. After trying unsuccessfully to reposition the trim or electrically disconnect it, Captain George aborted his mission.

He lowered his landing gear and began a slow descent toward home. During the descent, he was forced to "bear hug" the yoke for nearly an hour to prevent the aircraft from pitching over. He had to fly the aircraft at an approach-to-stall airspeed to lessen aerodynamic forces, but still had to hold an estimated 30-50 pounds of pressure on the yoke to prevent loss of control. This maneuver created tremendous fatigue, muscle cramps, and other physiological problems related to heavy exertion while completely enclosed in a full pressure suit.

Due to these physiological problems, he was unable to further configure the aircraft for a normal landing and still retain control. He was able to successfully execute a spiraling approach to the field and fly a perfect no-flap approach to a full-stop landing. WELL DONE! ■

USAF SAFETY AWARDS

DIRECTOR OF AEROSPACE SAFETY SPECIAL ACHIEVEMENT AWARD

INDIVIDUAL AWARD
MAJOR STEVEN P. HOCKETT

Headquarters Fifteenth Air Force
March AFB, CA

■ As Chief of Weapons Safety for Headquarters Fifteenth Air Force, March Air Force Base, California, Major Hockett's professional approach to problem solving and job knowledge enabled him to solve management problems across a wide range of safety concerns. His outstanding leadership was instrumental in significant improvement in the weapons safety program of all Fifteenth Air Force wings, and resulted in safer operations and more effective safety program management.

ORGANIZATIONAL AWARDS
1ST STRATEGIC AEROSPACE DIVISION

Vandenberg Air Force Base, California

The 1st Strategic Aerospace Division significantly reduced motor vehicle mishaps and military and civilian injuries, and met the presidential goal to reduce occupational injuries while managing one of the largest and most diverse safety programs in the entire United States Air Force. Missile and explosives safety accomplishments were equally impressive. Seventeen missile launches, each involving numerous hazards, were launched safely in support of vital national programs. These accomplishments, recorded in a highly demanding environment, attest to dedication and professionalism by all members of the division.

388TH TACTICAL FIGHTER WING

Hill Air Force Base, Utah

The concerted effort of the 388th Tactical Fighter Wing significantly reduced the frequency and severity of maintenance controlled mishaps. Additionally, military disabling injuries decreased 44 percent and property damage mishaps decreased 57 percent. These records were achieved in a highly demanding environment, requiring dedication and professionalism by all members of the wing.

1866TH FACILITY CHECKING SQUADRON

Scott Air Force Base, Illinois

The 1866th Facility Checking Squadron completed more than 65,000 hours without a single Class A or Class B aircraft flight mishap spanning a period of more than 24 years. This outstanding record was accomplished while performing a demanding mission involving flight inspections and operational evaluations of Air Traffic Control functions throughout the Western Hemisphere, and flying in the hazardous, low-altitude and high density environment of airport traffic and terminal control areas. ■