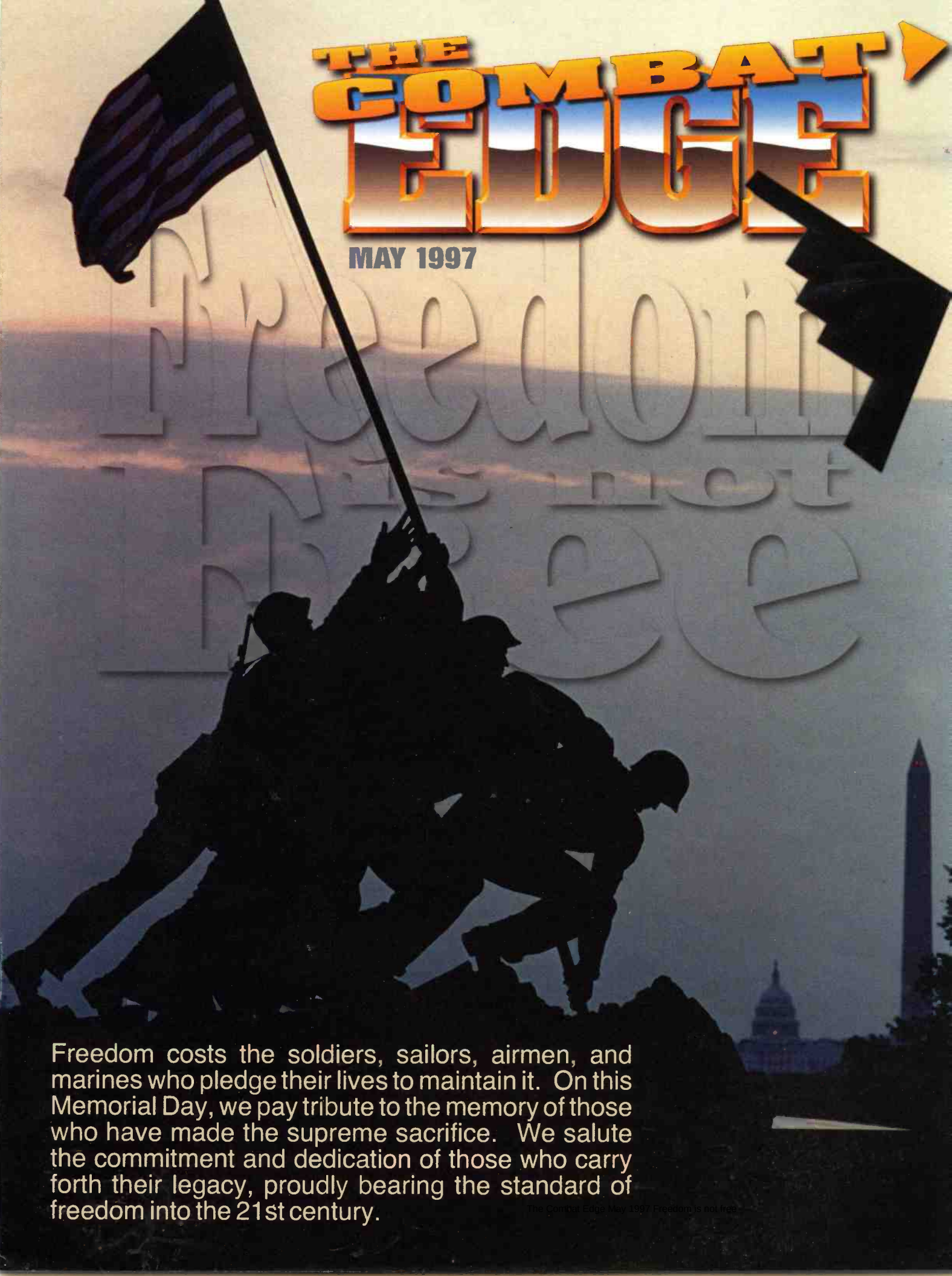

Freedom costs the soldiers, sailors, airmen, and marines who pledge their lives to maintain it. On this Memorial Day, we pay tribute to the memory of those who have made the supreme sacrifice. We salute the commitment and dedication of those who carry forth their legacy, proudly bearing the standard of freedom into the 21st century.

The Combat Edge

AIR COMBAT COMMAND
SAFETY MAGAZINE

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The Combat Edge (ISSN 1063-8970) is published monthly by the Air Combat Command, HQ ACC/SE, 130 Andrews St Ste 302, Langley AFB VA 23665-2786. Second-class postage paid at Hampton VA and additional mailing offices.
POSTMASTER: Send address changes to *The Combat Edge*, HQ ACC/SEP, 130 Andrews St Ste 302, Langley AFB VA 23665-2786.

DISTRIBUTION: F(X). OPR: HQ ACC/SEP. Distribution is controlled through the PDO based on a ratio of one copy per ten persons assigned. Air Force units should contact their servicing PDO to establish or change requirements. Other DOD units have no fixed ratio and should submit their requests to the OPR.
ANNUAL SUBSCRIPTIONS: Available to non- DOD readers for $30 ($37.50 outside the U.S.) from the Superintendent of Documents, PO Box 371954, Pittsburgh PA 15250-7954. All subscription service correspondence should be directed to the Superintendent, not HQ ACC/SEP.
CONTRIBUTIONS: Articles, comments, and criticisms are welcome. Write:

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MAY 1997
ACC SP 91-1 VOLUME 5 ISSUE 12

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DEPARTMENTS

ACCent on Safety

This issue marks the kickoff of our annual "101 Days of Summer" campaign. Several years ago, the Air Force recognized that the period between Memorial Day and Labor Day carried the greatest risks for accidents and injuries to our people and assets. The long, hot days of summer coupled with more people on the move for vacations and PCS travel, fewer people available at home station, turnover of key leadership positions and a host of other factors result in opportunities that are just "chock-full" of risks.

Despite the fact that the "101 Days" campaign has been remarkably successful in reducing the number of summer mishap instances, it remains as the period of greatest risk we all must face. Last year was no exception as the summer months accounted for nearly half of the ground mishap fatalities and over half of the flight Class A mishaps for the entire fiscal year. The mishaps ran a full gamut from auto accidents to drownings to aircraft mechanical failures to instances of personnel errors. In short, there's nothing from a safety standpoint that's not made worse by summer. So, what can we do?

Well, the first thing is just what we try to do with this magazine — spread the word. Not only is awareness our best defense, it's also the first in our six step Operational Risk Management (ORM) process; that is, Identify the Hazards. Second, we combine the probability of a hazard with its severity to Assess the Risk. Third, we Analyze Risk Control Measures and then, fourth, Make a Risk Control Decision. Fifth and sixth, we Implement Risk Controls and then Monitor and Adjust the operation as required.

Let's use an example to put this in perspective. We're going to play baseball and our mission is to be the batter. Immediately, one can recognize, most likely from prior experience, that there's a chance of taking the ball smack on the old beaner (step 1). Second, depending on who's pitching and whether it's hardball or softball, this could be a downright BAD thing (step 2). So, what can we do? Well, we could try batting from a defensive crouch, but that's not likely to help the team win. We do have some hard plastic hats, so maybe we could do something with those (step 3). Okay, we decide to go with the hats, but only if they're in a team color (step 4). Then, we tap one of these "brain buckets" on and stride to the plate (step 5). When that first pitch whooshes by unseen, we recognize that it might be slightly too big — time to put the ol' ball cap on, then the helmet (step 6). Now, we're somebody; let's take it downtown!

Well, I hope you get the idea. The threats are out there, some small, some big, but with ORM we have a tool to better prepare ourselves. It doesn't have to be used in a complicated manner, but it darned sure ought to be used. Use it for everything you do and, come Labor Day, I'll bet you're still one of the guys enjoying summer and not one of its victims.

"101 Days of Summer" – make 'em fun; take care and be safe!

Colonel Turk Marshall
Chief of Safety

Who, Me? "The In

Colonel Vinnie Noto
HQ ACC/SEF
Langley AFB VA

As I promised in the March issue, I'd now like to tell you about my first aircraft mishap investigation. I was selected to be the Investigating Officer (IO) and to share responsibilities of representing the unit. It was all over the national news: "Multimillion Dollar Aircraft Crashes! Three Fatalities!" You can imagine the pressure, the questions and the grief. The B-1B community was small then; we knew all those involved, both living and dead. The Instructor Pilot (IP), who was a fatality, had been my IP. The stage is set! Do you get the picture?

I remember well the first walk-through of the site. The on-scene commander had set up the entry point on the top of a mesa where the plane had crashed. We walked into an old Army tent with all sorts of food, communication gear and people setting up. It was already very dusty and hot. He pulled out a sectional and laid it on a make-shift plywood table. He briefed us on the location of the main wreckage and the recovery operations in progress. His briefing did not do justice to the enormity and chaos of the crash scene. After the brief, our Board President (BP) assembled the whole team (it's important for the whole team to see the site) and said, "Let's go for a walk." Old boots, gloves, masks, backpack, shovel, hammer, stakes — I was ready.

I didn't know it would be several hours before we returned. Even a scene from "Outbreak" wouldn't have prepared us for the sight. Not far from the Entry Control Point (ECP), I saw several small unrecognizable pieces. As we crested a small hill, I was taken aback by the devastation I saw. The main wreckage crater was still smoldering; burned, charred terrain and the strong smell of jet fuel was everywhere. I didn't recognize anything. We walked, walked and walked some more. My ability to get around the site was pivotal to locating and recovering parts. It was and still is critical to get a full picture of the crash scene and mark where engines, flight controls and cockpit were.

The crash site was over one and a quarter miles long and at least a half mile wide. I later found a major engine piece and a wing pivot pin over one and a quarter miles from the main crater. This was my first clue that identifying and marking parts was going to be an enormous challenge. I knew I needed some experts who could identify parts. We took lots of pictures, videos and stills that day. All these were important because the site changed everyday. The site was a busy place; recovery of remains as well as classified data continued and site security was being set up. Security was an important issue we had to deal with immediately. We had all sorts of visitors, both human and non-human, and used our weapons several times (on those non-humans, of course).

Our aircraft had crashed on private property and the egress site (seat and hatches) was on another landowner's property. Other parts we later found were spread out over miles of eastern Colorado countryside. This required several ECPs. We had to work out specific arrangements with several landowners for access. We got lots of help from the base legal office, the local police and state troopers. Several of those who went on the witness hunt saw a few gun barrels, so it was nice to have

vestigation Begins"

the local police along for support! Later on in the week, we learned that several children had picked up some parts and were showing them around school. The local police solved that one for us in an instant. Get to know who in the local community can help; they are usually very willing. The people of La Junta, Colorado, were very supportive; and, oh yes, don't forget to say thanks. A letter from the BP, a picture or plaque are all good gifts to provide the community in appreciation for their support.

The rest of Day One was a blur, but I do remember that my feet hurt and I was filthy and covered with some unknown substance. The enormity of what we had to do made my stomach turn. That night, our BP gathered the team together; we told him what we had accomplished that day and what we thought we needed to do next. We did this everyday of our investigation, and it proved to be our most effective means of letting the whole board know what each team was doing.

As our investigation grew, so did each team. At its high point, I remember almost 50 people crammed into our little room; and that was just the immediate board. Hundreds would eventually be involved. We set goals for Day Two and took homework with us. Our last words were generally where we were all going to eat. Don't laugh, you can't imagine how much I learned and discovered over a beer and a burrito!

We decided we would have a brief meeting (roll call) every morning to confirm our plans for the day. This was important because of the limited number of vehicles and the distance we needed to drive to the location of the survivors, witnesses and wreckage. We had decided on the first day to use part of the La Junta Radar Bombing Site as our working space. We would drive out to the crash site and places beyond from there. This was a good move because it was a secure location plus we needed constant access to military DSN and commercial telephone lines.

At this point, two individuals whose areas of expertise I had not given much thought to proved to be our lifesavers! We had an AF contracting officer and a military pay representative with the board. We soon discovered that the logistics of this operation would stop us cold if we didn't get a grip on it soon. We needed gas, equipment, gloves, shovels, masks, maps, film, tractors, flatbeds, etc. (we eventually rented out a hotel). Not everything could be obtained from Peterson AFB, several hours away. We needed a way to get people back and forth from the airport. This became a challenge as we eventually had people out all over the country; at depots, labs, etc., analyzing data and parts. Have you ever tried to package a damaged, burned part and then carry it with you on a commercial aircraft? Not fun! Its seat cost more than mine.

Well, I think I've set the stage for what would turn out to be a very long and complex investigation. No wonder we call the final report the "White Elephant." I've already run out of space and haven't really got past Day One. Hopefully, I'll finish the story soon, but things to look forward to as this investigation continues are my low-level flight in an Army helicopter across the Colorado countryside, witnesses who just want to talk, a great trip to Washington D.C., the long in-ranks march across the mesa and the day our BP disappeared. I hope you found this article interesting and informative. For those of you who were with me — it's all true, isn't it? ■

TWISTER

SMSgt Gary Reniker, USAFR, 442 FW/SE, Whiteman AFB MO

Being stationed along the path of "Tornado Alley," most of us have become accustomed to the weather. Overhead, dark greenish clouds pile up, powerful and solid-looking as a ridge of mountain peaks. The wind suddenly gusts warm and steady with sporadic bursts of rain and lightning. A sudden stillness is pierced by the base siren warning people of a possible tornado approaching from the west and for people to scramble immediately and take cover. It's times like this that make the Great Plains a thrilling place to live (right?).

Severe weather has always been an important topic for the Midwesterner. I've decided to share some interesting tornado topics with those of you who may find yourselves heading for Whiteman or another area with similar weather patterns.

Q. Is it true that tornadoes do not tend to hit cities?
A. Yes. In the same sense, if you throw darts at a board covered with a map of Tornado Alley, you're unlikely to hit a city. Because large cities make up a tiny part of the land surface in tornado territory, they are unlikely to be hit. However, while cities offer a bit of "discouraging interference" to tornadoes, it's not enough to make a difference, according to Lynn Maximuk, meteorologist in charge of the National Weather Service in Pleasant Hill, Missouri. As proof, he points to Dallas, Detroit and Cleveland, all of which have been struck by tornadoes.

Q. Tornadoes have a reputation for rearranging the landscape. How far have they been known to fling objects in their path?
A. Heavy items such as cars and appliances frequently are found hundreds of yards or even a couple of miles from where they started. Lightweight objects go much, much further. For example, after a 1974 tornado dashed through Xenia, Ohio, bank checks were found in the southern suburbs of Cleveland, about 200 miles away, according to Maximuk.

Q. Is there a "calm before the storm" when a tornado occurs?
A. Yes — but only in a relative sense. Tornadoes generally occur in the late afternoon or early evening, after a predictable sequence of "noisy" events, punctuated by a couple of relative quiet moments. As tornadic conditions are developing several thousand feet overhead, the wind on the ground slows. This is because the tornado forming a few miles away is sucking in energy from all around, neutralizing the surface winds. Then, activity picks up again, with wind gusts followed by light rain, heavy rain and hail. Following this sequence of events, the precipitation stops, giving a sense of unusual stillness. Then, the tornado breaks loose.

Q. What creates the dark, sometimes greenish sky color that accompanies tornadoes?
A. Large raindrops and precipitation in the form of small pellets of ice (i.e., suspended hail).

Q. Does opening the windows of a building reduce damage by equalizing air pressure?
A. No. Most property damage from tornadoes results from wind simply pushing structures over, as well as from flying debris which can puncture people as well as penetrate objects. In assessing damage from some of the nation's most virulent tornadoes, Maximuk said he has seen a playing card embedded in a 2-by-12-inch rafter and a pen-

cil that had been driven into a round metal fence post. "I've also been on disaster surveys where people had cigarette butts embedded in their skins," he said. "Anything moving at 250 miles per hour is a bullet."

Q. Which is more powerful, a hurricane or a tornado?
A. The Midwest easily whips the Gulf coast for wind speeds. The highest wind velocity on record was the 315 miles per hour tornado gust in 1990 that swept through Hesston, Kansas. Hurricanes, which essentially are ocean-going tornadoes, generally do not produce winds in excess of 150 miles per hour. However, hurricanes cover a much broader area, often 200 miles or more across. In contrast to this, tornadoes are typically only a half-mile wide, or occasionally as much as one and a half miles across.

Q. Mobile homes and their residents account for much of the death and destruction caused by tornadoes. What percentage of tornado deaths occur among people in mobile homes?
A. About 45 percent of the people killed in tornadoes were in mobile homes when twisters struck. In comparison, only about 5 percent of Americans live in mobile homes.

Q. What states are within areas of intense tornado activity?
A. "Tornado Alley" includes a wide band that runs through the middle of Kansas and Oklahoma, as well as the northwest corner of Missouri and a swath of the Texas panhandle. A secondary band with fewer tornadoes encompasses much or all of Texas, Oklahoma, Kansas, Nebraska, Missouri, Illinois and Indiana.

Q. How many tornadoes are reported in an average year in the United States?
A. It's somewhere around 1,000 with at least a couple hundred in "Tornado Alley," according to Fred Ostby of the Storm Prediction Center in Kansas City. Forty years ago, he estimates, the number reported was perhaps around 400. The higher number of tornadoes accounted for today does not reflect an increase in severe weather over the past few years; rather, it demonstrates improvements in technology for monitoring of severe weather, better communications and more tornado chasers with camcorders.

Q. How many people typically die in tornadoes each year in the United States?
A. The actual number of casualties per year varies substantially. However, according to Ostby, the average death toll over the last 30 years is about 80 per year.

Q. What conditions make the southern Great Plains region of the United States so conducive for tornadoes?
A. The southern Great Plains is where air masses with different temperature and humidity levels collide. Warm, moist air from the Gulf of Mexico often meets here with cooler air from the North and sometimes with hot, dry air from the West or Southwest. The differential in temperature and humidity provides the energy and the unstable setting that can generate a tornado.

Q. How can we best protect ourselves during a tornado?
A. You want to be low and as far away from an outside wall as possible. Ideally, that might mean the basement of a building, under a stairwell, inside a bathroom or somewhere else with the maximum number of walls between you and the oncoming storm. Severe storm forecasters no longer suggest seeking out the basement wall closest to the storm. Placing yourself in the middle of the basement is generally better.

Q. What is the best device for detecting a tornado?
A. The Doppler radar, which has been installed the last few years, has been a boon to severe storm forecasters. However, no technology is currently available that has been able to take the place of human storm spotters who provide their services free throughout the tornado region. "We talk a lot about the technological advances that have been made," Ostby said. "But the old cliche — the best tornado detection tool is the human eye -- still holds true." ■

Monthly Awards

PILOT SAFETY AWARD OF DISTINCTION

Capt John Tomjack
99 RS, 9 RW
Beale AFB CA

During recovery from an operational combat mission in support of Operation JOINT ENDEAVOR, Capt Tomjack experienced total loss of hydraulic pressure while cruising above FL600. The U-2 requires hydraulics to control all drag devices, pitch trim, roll spoilers, normal landing gear extension and braking. Although Capt Tomjack had flown for 8 hours in a pressure suit, he was still able to lower the landing gear manually and use residual hydraulic fluid to lower 10% flaps before complete system failure. After a 1-hour descent from altitude, in which he had to fight trim pressures caused by the loss of pitch trim, Capt Tomjack was able to position the aircraft for a no-flap landing. Standard U-2 No-Flap patterns are a 360 degree overhead pattern, with 2-3 mile final, flown 1-2 knots above stall speed to generate sufficient drag to allow a 1.5 to 2-degree glideslope. Despite severe fatigue, heavy control loads and battling extreme aircraft vibrations caused by the disintegrating pump, Capt Tomjack successfully flew a flawless approach, touching down in the first 1,500 feet and safely stopping the aircraft using the emergency braking system. Capt Tomjack's superb airmanship and flying ability, in addition to his cool decision-making, saved an extremely valuable national asset.

GROUND SAFETY INDIVIDUAL AWARD OF DISTINCTION

TSgt Thomas P. Fiaccato
334 FS, 4 FW
Seymour Johnson AFB NC

Sergeant Fiaccato is a key to the 334th Fighter Squadron's success, helping earn the 1996 ACC Daedalian Award, 1996 Quality Air Force Assessment "Outstanding" rating, consecutive ACC Maintenance Effectiveness Award nomination, and two consecutive Wing Safety Inspection "Outstanding" ratings. He is the Top Gun of safety program managers. Sergeant Fiaccato's attention to detail resulted in the first inspection ever conducted by a wing Safety Office with zero OSHA safety violations! Truly benchmark results! In preparation for the annual safety inspection, Sergeant Fiaccato checked and rechecked every section, building and office. His knowledge and expertise in AF, OSHA and local safety directives are so impressive that other squadrons request him to set up their safety programs. In spite of the tremendous demands on his time, all his Employee Safety & Health Records are perfect! Sergeant Fiaccato seizes the initiative. He noticed safety goggles were wearing out fast and impairing maintainers' vision. He researched and acquired over 100 pairs of improved safety glasses, resulting in better visibility for our maintainers and safety working conditions. He also researched, located and purchased higher quality steel-toed safety boots instead of the issue boots—improved quality at reduced cost! Sergeant Fiaccato's continued outstanding contributions allow the 334 FS to do more with less, and to do it safer than anyone else!

AIRCREW SAFETY AWARD OF DISTINCTION

Capt Michael Messer, Capt Sean Fox
336 FS, 4 FW
Seymour Johnson AFB NC

Capt Messer and Capt Fox were number two on an F-15 two-ship range sortie out of Seymour Johnson AFB NC. En route to the range, on the low-level portion of the ride at 500 feet AGL, Capt Messer encountered a flock of birds directly in and above his flightpath. He immediately tried to maneuver the aircraft to avoid impact, but one or more of the seagulls impacted the canopy. A loud "thud" followed by a violent rush of air was experienced as the forward portion of the canopy shattered and was thrust into the aft cockpit impacting Capt Fox in the face and chest. Capt Messer quickly slowed the aircraft from 500 knots and began a climb to 6,000 feet. Although injured and experiencing severe wind blast, Capt Fox selected steering to Seymour Johnson AFB. Unable to talk to each other via intercom or radio, Capt Messer and Capt Fox were able to communicate using prebriefed flight control inputs and the good ole' "thumbs up." The flight lead rejoined on the damaged aircraft while Capt Messer used hand signals to verify his intentions and best airspeed. As the lead aircraft coordinated for an Emergency Approach and medical support, Capt Messer dumped fuel, configured and performed a controllability check. With radio communications now possible due to slower airspeeds and less wind noise, Capt Messer was given the lead on final as he and Capt Fox verified no cable engagement was anticipated. After an uneventful landing, Capt Messer taxied clear of the active runway and shut down as the emergency crews responded. The outstanding airmanship and exemplary crew coordination displayed by Capt Messer and Capt Fox under austere conditions was crucial in their safe recovery and the recovery of a $50 million Air Force asset.

FLIGHT LINE SAFETY AWARD OF DISTINCTION

SrA Curtis R. Chism, SrA Matthew S. Hartz, SrA Gaetono Salvo, A1C Steve McDonald
20 BS, 2 BW
Barksdale AFB LA

Airmen Chism, Hartz, Salvo and McDonald were members of an Electronic Warfare System (EWS) preflight team responsible for performing B-52H EWS preflight inspections on five morning flyers. As part of the inspections, the team used an AN/ALQ-155 Jamming Transmitter System servicing kit which normally contains an odorless liquid used to cool the ALQ-155 electronic components. The team completed the servicing of two B-52Hs; while servicing the second aircraft, Amn McDonald detected an ether-type odor and notified the other team members. The team gathered to discuss the extremely strong odor. Checking further, the team determined that the servicing kit had been accidentally filled with an ether-based solvent The solvent has a 115 degree flashpoint and is normally posted with warnings to keep away from heat, flames, sparks and electrical equipment. Amn Chism immediately notified Maintenance Supervision of the potentially disastrous situation and recommended a possible solution. Airmen Hartz, Salvo and McDonald purged the servicing kit with the correct fluid. With less than 4 hours to scheduled takeoff time, the team quickly removed the affected units from the aircraft, drained and purged the solvent, then reinstalled and correctly refilled the units on the aircraft. The aircraft took off on time and successfully completed their assigned missions. The team's swift actions prevented catastrophic damage to two B-52H aircraft and possible loss of life.

CREW CHIEF EXCELLENCE AWARD

SSgt Cary Brown
429 ECS, 27 FW
Cannon AFB NM

SSgt Cary Brown distinguished himself on two occasions while deployed to Saudi Arabia in Support of Operation SOUTHERN WATCH. Sgt Brown was assigned as the EF-111 aircraft crew chief on tail number 66-0036 during the 429 ECS' 24th rotation. Sgt Brown was performing an early morning launch of his aircraft. While inspecting the main wheel well with engines running at 80 percent, he identified a small high pressure bleed air leak coming from behind the insulation blanket on the service air duct. The location of the leak was discovered in an area not specifically listed as an inspection area in the aircraft launch checklist. His astute attention to detail allowed him to identify this fault in an area that is extremely difficult to access, compounded by the fact that the line's insulation blanket deflects any leaks along the hot air duct. Sgt Brown's extra effort during the inspection pinpointed this potentially dangerous situation. Bleed air leaks in the main wheel well of the EF-111 are particularly dangerous due to the main engine fuel feed lines and numerous hydraulic lines cramped in a very tight area once the gear is retracted. Bleed air leaks have erupted violently in the past causing temperatures in the wheel well to exceed 600 degrees Fahrenheit, damaging tires, avionic and environmental systems and causing fires prior to aircrew overtemperature warning. Sgt Brown's meticulous attention to detail, above and beyond what is required, averted at a minimum, an inflight emergency that could have placed both the aircrew and aircraft in a potentially disastrous situation.

UNIT SAFETY AWARD OF DISTINCTION

59th Fighter Squadron
33 FW
Eglin AFB FL

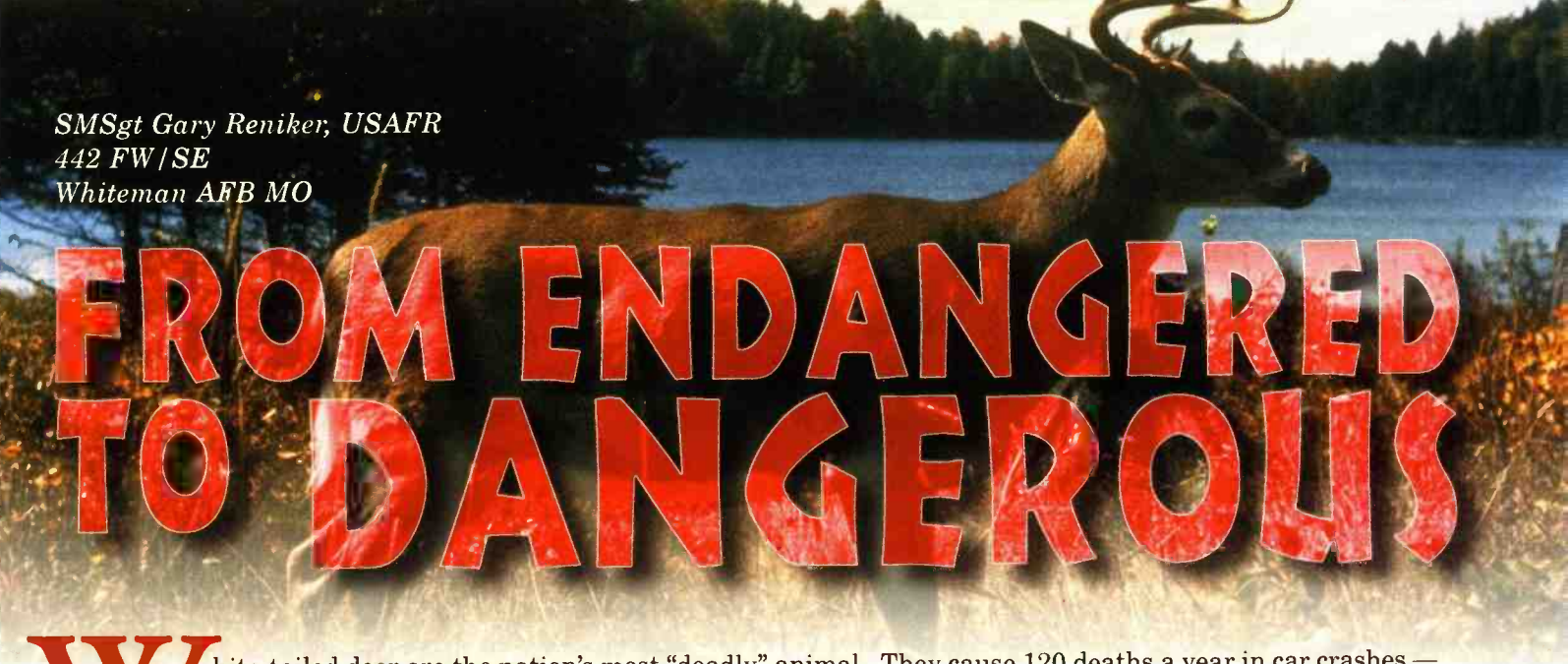
From April 1979 to February 1997, the 59 FS Proud Lions flew 100,000 Class A and B mishap-free flight hours. The Proud Lions are only the second F-15C squadron in Air Force history to accomplish such a feat, and the y have so while maintaining a high OPS TEMPO, the highest among ACC F-15C units over the last 18 months. Their journey to 100,000 Class A and B mishap-free hours has included numerous Flag deployments, six Operational Readiness Inspections in which they received Excellent or Outstanding ratings, at least seven ocean crossings in support of operational requirements, two Icelandic Defense Force deployments, participation in Operation DESERT STORM, which was highlighted by two MIG kills, and four deployments in support of Operation SOUTHERN WATCH. Recently, their squadron received an Excellent in all areas with no discrepancies during the 1996 annual *Nomad* Safety Inspection, despite being deployed for more than 220 days in FY 96. They have safely accomplished their wartime mission, logging more than 4,000 hours of combat time in the last 14 months, all with the youngest squadron in the F-15C community. The 59 FS Proud Lions' commitment to safe flight operations is evident in their accomplishments and reflects highly upon the 33d Fighter Wing and the United States Air Force.

WEAPONS SAFETY AWARD OF DISTINCTION

MSgt Michael L. Beale, TSgt Rafael R. Armenta, SSgt David G. Brown
SSgt Alan W. Hotz, SSgt James E. Walter, SrA Thomas G. Herron
SrA Joseph A. Rodriguez
24 CES, 24 WG
Howard AFB PN

The Explosive Ordnance Disposal Flight conducted two significant disposal operations. The first on 1 Aug 96 during a joint operation with the Army, the team was tasked to eliminate 1,440 unserviceable 2.75 inch rocket motors, 2,300 rounds of small arms and approximately 60 flares on the Empire Range Complex, Panama. All the propellant grains from the MK 40 MOD 3 rocket motors were removed from the casings to alleviate the possibility of any items going propulsive. The motors and associated components were then burned. The service they provided eliminated the hazardous ordnance, created valuable additional storage space and was completed without incident. The second operation was quite monumental and one of a kind. The Chairman, Joint Chief of Staff of the El Salvadorian Armed Forces (ESAF), requested US supervision and expertise from the Commander in Chief, United States Southern Command, for the destruction of the country's unserviceable and excess ordnance weapons. The flight was ultimately tasked to plan, organize and dispose of over 950 tons of ordnance items, 16 million rounds of small arms ammunition and over 4,200 weapons. The ordnance they encountered at the seven storage facilities around the country consisted of projectiles ranging in size from 40 mm to 120 mm, grenades, landmines, rockets, bulk explosives and various sizes and types of small arms. Flight members and ESAF personnel worked 12-hour days for a week to separate the munitions. On 19 Aug 96, the main contingent of personnel arrived in country to proceed with the disposal portion of the operation. Twice a day for 2 weeks, 20 2 1/2-ton trucks were loaded with munitions and then driven 25 miles to the site for disposal. From 28-30 Aug 96, over 60 truckloads of small arms ammunition were moved to the designated burning pit. Under the supervision of the team, the explosive laden vehicles traveled over 15,500 miles without a single mishap. An operation of this scale had never been attempted before in Latin America and completed without a reportable injury. Last but not least, while on a contingency operation based out of Howard AFB, Panama, the 23d Special Tactics Squadron, Hurlburt Field, Florida, requested general demolition training for members of their unit. On 26 Sep 96, the training was provided and it better prepared the team for current and future operations where they might be required to employ explosive procedures and techniques.

SMSgt Gary Reniker, USAFR
442 FW/SE
Whiteman AFB MO



FROM ENDANGERED TO DANGEROUS

White-tailed deer are the nation's most "deadly" animal. They cause 120 deaths a year in car crashes — no animal causes more human deaths. Also, no other animal causes more property damage. The average damage is more than $600 to each of the 300,000 vehicles involved each year in car/deer collisions, says George Harrison in an article he recently wrote for *Sports Afield*. Harrison cites figures from the Insurance Information Institute. The total cost: more than $180 million!

Deer are often a local matter, too. Whiteman AFB MO, where I'm assigned, is located in the central portion of the state and is almost surrounded by Knob Noster State Park. Each day you can look out your window and view the deer grazing leisurely about the base. Statewide, over 7,700 collisions were reported to the Missouri Department of Conservation. These numbers actually understate the problem because of the many minor collisions that go unreported to authorities.

Sixty years ago people were genuinely concerned that deer would soon be extinct. Today more than 25 million white-tail deer and 5 million mule deer roam the United States. Those populations continue to climb. It's estimated the nation has more deer now than at the time of the European settlement.

The cause of the population explosion is multifaceted. Foremost, state conservation departments have for decades successfully managed deer for hunting by providing the animals with food, cover and protection. Most of the 65 million people who feed wild birds in their back yards also have successfully managed deer by unwittingly attracting, feeding and providing them an optimum habitat. Also, humans have removed most natural predators such as mountain lions and wolves. Nature has also had a hand in the deer success story. Before the 1980's, winter kill was part of the deer management formula. However, for more than a decade, mild winters have resulted in virtually no mortality. ■

There are things we can do to protect ourselves and our property against the burgeoning "Bambi" population. Here are some ways:

- Drive defensively. Pay attention to "Deer Crossing" signs. If a collision is inevitable, don't try to avoid the deer at the risk of killing yourself. Hit it, but control your car.

- Don't feed deer in your back yard. This only increases their reproductive success, reduces their fear of humans and invites them to dine on your shrubs and flowers.

- When hunting, don't settle only for a "trophy." If every hunter killed one deer, it would go a long way toward reducing herd sizes.

- Wear insect repellent when you are out in nature. Why even consider repellent? Disease-carrying ticks are spread by deer. Among the diseases is Lyme disease. Don't ignore the symptoms of Lyme disease — bull's-eye rash, lack of energy and aching muscles. See your doctor; it can be treated if detected early.

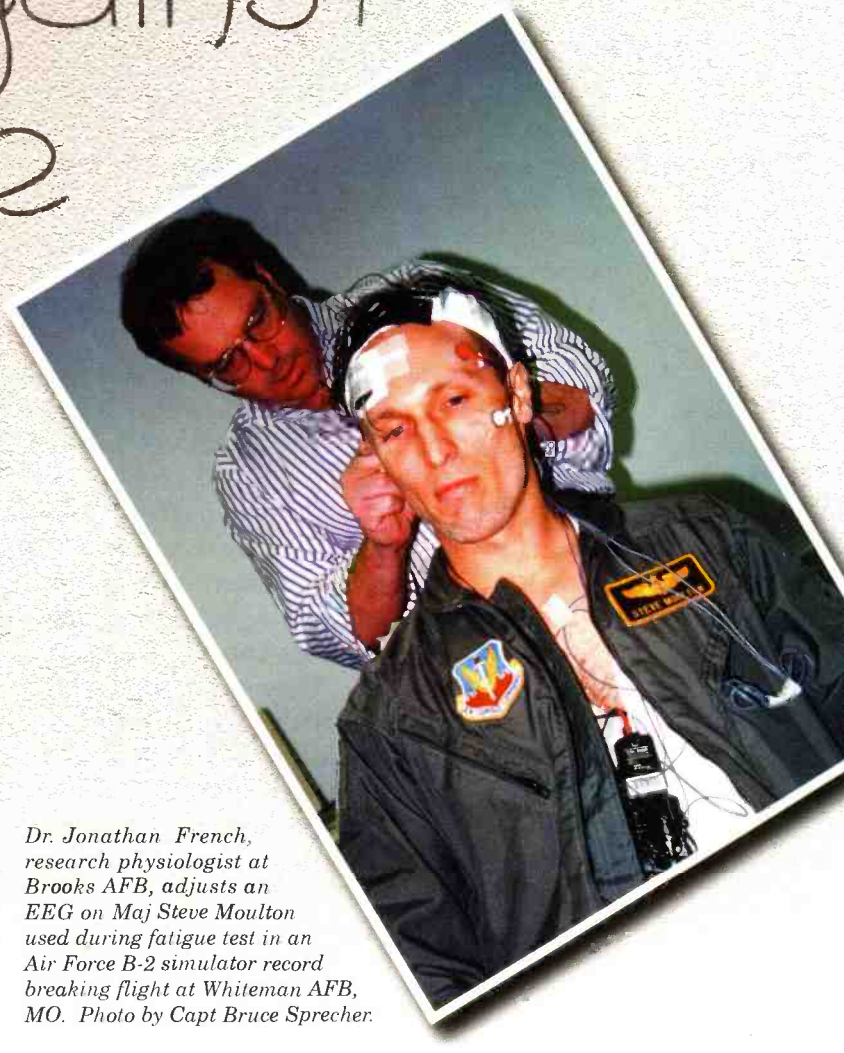
The Tireless War Against Fatigue

Mr. Rudy Purificato
Armstrong Laboratory
Brooks AFB TX

Air Force long-duration mission crews long ago tired of their battle with the scourge of operational readiness — insufficient sleep. Now, Brooks AFB scientists in San Antonio TX may be on the verge of helping them put "Mr. Sandman" to rest. Armstrong Laboratory research physiologists (Dr. Jonathan French and Jeff Whitmore) and the Crew Technology Division's Sustained Operations Branch are working with other sleep deprivation experts throughout the world to develop countermeasures for an assortment of slumber-related conditions that affect job performance.

Sleep deprivation studies potentially have tremendous medical, economic and military value. While non-governmental civilian scientists, foreign researchers and the U.S. Army and Navy have conducted sleep research, Armstrong Laboratory has the only Air Force scientists conducting sustained operations research. With the number of U.S. overseas bases diminishing worldwide, Air Force global power missions sometimes last 30-36 hours. In fact, the Air Force long-duration mission record of 36 hours was set several times during the Persian Gulf War.

Armstrong Laboratory sleep experts obtained valuable data from the now declassified "Secret Squirrel" mission that launched B-52 crews from Barksdale AFB LA in the first air war strike against Iraq. "We interviewed 60 percent of the 'Secret Squirrel' mission crews concerning their biggest source of fatigue. They told us that it was very hard for them to sleep in flight," French said. He explained that the crews' "iron man mentality" kicked in as they tried to stay awake throughout the mission by drinking coffee. The 7-ship B-52 raid on Iraq during the first day of Operation Desert Storm stressed the aircrews. The B-52 crews suffered fatigue and anxiety throughout the flight, most notably during



Dr. Jonathan French, research physiologist at Brooks AFB, adjusts an EEG on Maj Steve Moulton used during fatigue test in an Air Force B-2 simulator record breaking flight at Whiteman AFB, MO. Photo by Capt Bruce Sprecher.

in-flight refueling operations on the return leg of the mission.

More recently, French and colleagues monitored fatigue among Air Force crews who supported Operation Joint Endeavor in Bosnia. Since September 1995, "flying linguists" with the Air Intelligence Agency headquartered at Kelly AFB TX have flown long-duration Balkans missions. They have been asked to fly tremendous numbers of hours on unpredictable schedules and had long shifts since there are so few Air Force Serbo-Croatian linguists. The long shifts, coupled with ever-changing sleep schedules, prevented linguists from getting enough rest. As a result, they were not functioning at peak performance.

French, who flew on many Bosnian missions, said the linguists' 15-hour-on-station work schedule was the result of limited crews sharing a 24-hours-a-day, 7-days-a-week "race track pattern" over Bosnia: "The conditions were terrible. It was extremely cold in the aircraft and there were a lot of human factor problems." Making matters worse was the nature of the linguists' mission. They were engaged in perpetual listening, without relief, to earthbound communications from both friend and foe amidst the constant drone of aircraft noise. Senior Air Force leaders who knew about the problem asked French's team to develop a strategy to help improve fatigue-challenged pilots and linguists' work performance. His recommendations included predictable and shorter shift schedules as well as improved aircraft insulation using carpeting and better crew hygiene. The study team talked to 80 percent of the linguists on how to sleep better — to better organize their sleeping environment. They also taught them stress reduction techniques. Air Force leaders characterized these recommendations as a tremendous asset to the on-going Bosnian mission.

Ever since mankind became airborne, fatigue has been an unrelenting and unforgiving foe. Its main ally is sleep debt. Sleep debt is a self-induced sleep thievery. Sleep debt occurs when you deprive yourself of sleep at night. Most normal adults need 7 to 8 hours of sleep. If you lose 2 hours of prime sleep over a couple of days, you begin to develop acute sleep debt. While the human body is forgiving regarding sleep loss recovery, people must pay back their sleep debt before serious consequences occur. Even long naps (3-4 hours) will not eliminate significant sleep debt. Sleep deprivation caused by travel or irregular sleep/wake cycles disrupts the body's internal clock. Symptoms include irritability, distortion of time and distance, digestive distress, physical strength degradation and sleep disorders such as insomnia.

Due to increasing global power taskings, B-1 and B-52 crews are conducting essentially two kinds of long-duration missions. The first involves taking off in the morning and landing late the next day. The second involves taking off in the evening, then flying through the second night to get home. Scientists have found that the period between 2 and 6 a.m., when sleep inertia is the greatest, is a very dangerous time.

In a prelude to ending fatigue's grip on operational readiness for long-duration missions, French's team recently helped B-2 pilots break the Air Force record for the longest simulated flight. The history-making B-2 simulator flight of 44.4 hours was established on February 1, 1997, at Whiteman AFB MO by Major Steve Moulton and Captain Jeff Long. The event was dubbed "Vigilant Spirit II." B-2 commanders wanted to know the impact of fatigue on 36-hour missions before they became fully operational across the entire spectrum of conflict. The B-2 community is concerned about the workload affecting job performance. They base this on the workload required to operate such a sophisticated aircraft with a crew of two.

The record-breaking simulator flight followed two previous record-setting B-2 simulator flights of 34 and 38 hours, respectively, held last fall. The simulator flights were designed to help the 509th Bomb Wing become fully operational with the Air Force's sole B-2 bomber fleet. In January 1997, the National Command Authority

declared a Limited Operational Capability (LOC) for the 509th's B-2 fleet; the B-2 aircraft can now be used on combat missions in a conventional bombing role, if needed.

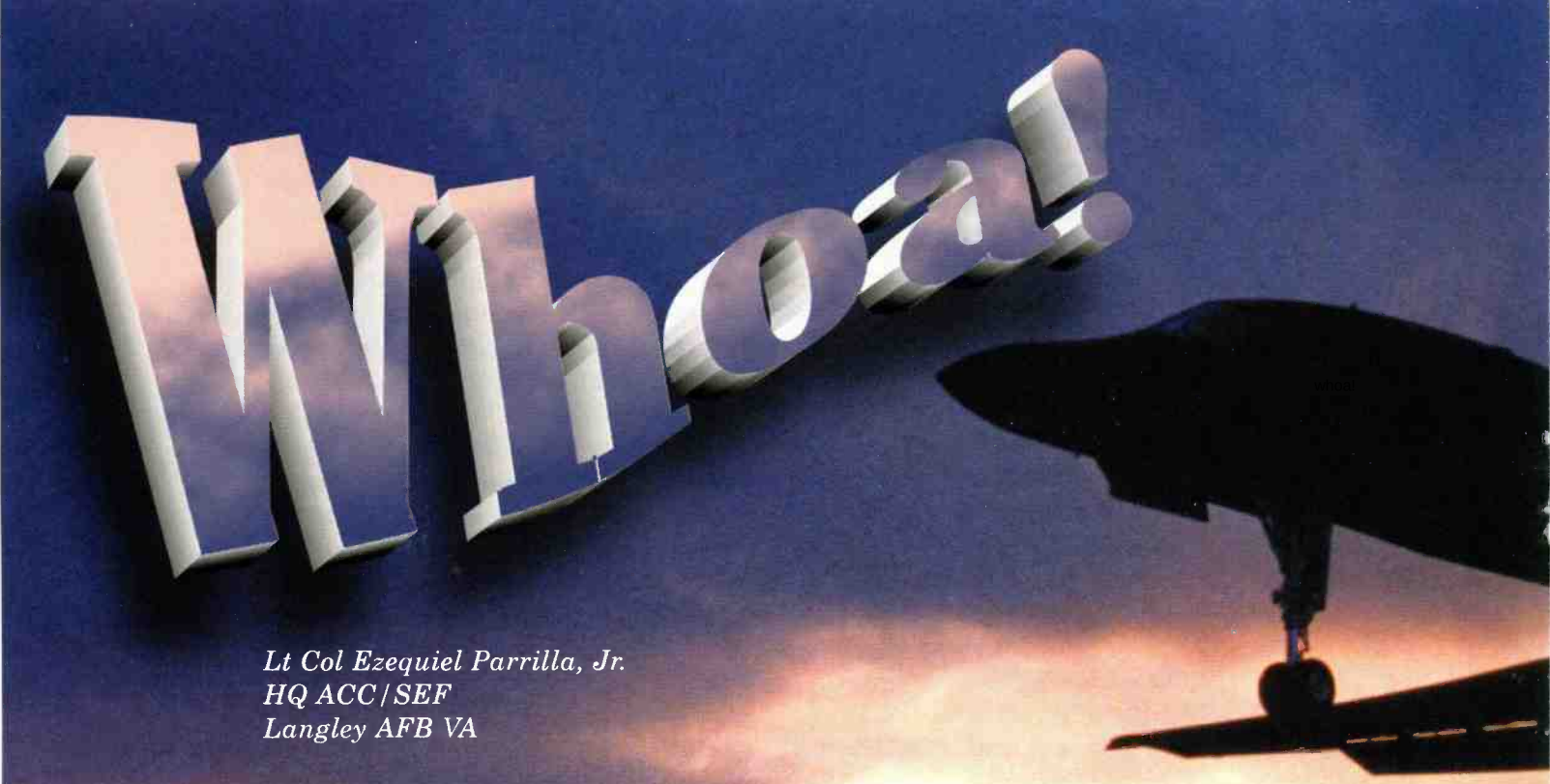
To track pilot fatigue during the B-2 test, the pilots' heart and brain functions were monitored through Electrocardiogram (EKG) and Electroencephalogram (EEG) systems. Sleep is defined by EEG (brain wave) phases. EEG data is a real companion to the study team's work because it can determine the quality of sleep a person is getting and how restorative it is. In addition, the team looked at episodes of micro-naps that occurred during certain critical phases of the mission, such as the period after a bombing run. The strategy used in the B-2 test included strategic naps lasting 3-4 hours and micro-naps of 20-30 minutes. B-2 simulator test crews also rotated sleep periods, with one member resting while the other operated the aircraft.

Armstrong Laboratory sleep experts' work with bomber pilots is part of a trend that has developed over the past 10 years in which the limits of human endurance in flight have been extended on ever-increasing and longer Air Force missions. According to a recent Air Force Reserve magazine article, between 1954 and 1990, the Air Force was involved in 10 operational contingencies. Among these contingency missions were Operation Urgent Fury in Grenada and Operation Just Cause in Panama. Between 1990 and 1994, Air Force Reserve crews alone had been involved in 22 contingency operations. Relying on pioneering sleep research at Brooks AFB, Air Force planners are stepping up their tempo to counter slumber's threat to aircrew efficiency and safety.

"Our main concern is for them (crews) to think about fatigue before their mission starts," Whitmore said, explaining that awareness is key to long-duration mission success. Says French, "We want them to treat sleep seriously." Warfighters have become increasingly cognizant of the importance of preparing themselves for increasingly longer missions. Referring to the B-2's capability, Armstrong said, "In the history of manned flight, no aircraft (prior to the B-2) has been required to, or has been capable of, flying this length of mission with a limited crew." This refers to a potential scenario in which B-2 crews would be required to fly 53-hour missions. We must now ask ourselves, "What will that do to the crew regarding fatigue? Can they sustain their performance?" Researchers hope to find the answers to these and other critical operational readiness questions as testing continues this year. ■

Close-up of EEG system developed by Armstrong Lab that measured brain wave activity and eye blink movement during fatigue test . Capt Jeff Long, above, was one of two B-2 pilots involved in the test.

Whoa!

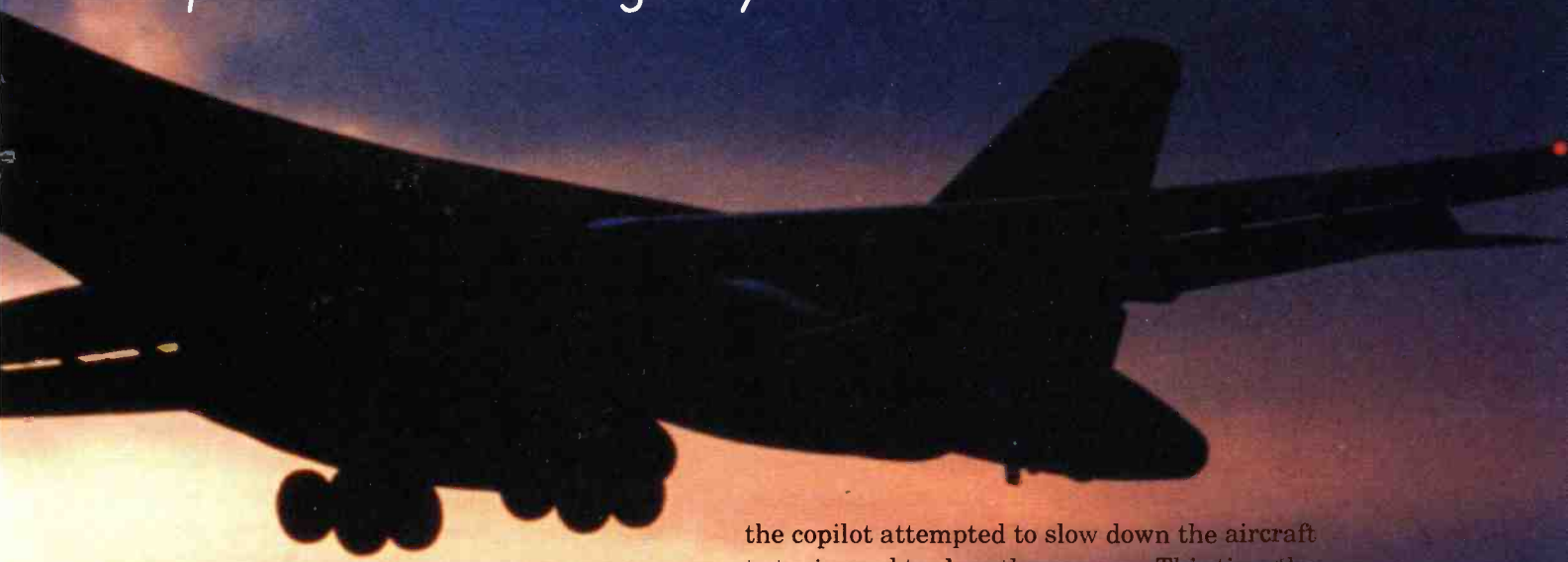


Lt Col Ezequiel Parrilla, Jr.
HQ ACC/SEF
Langley AFB VA

There we were, slipping the surlies in our "Bone." The tone-dropping and name-that-tune portion of the flight had progressed normally, and we started an en route descent 30 miles north of Base D. At that point, the Central Integrated Test System (CITS) flagged a MUX 13 message. For those not familiar with the B-1B's many acronyms, the CITS is a system that monitors aircraft systems. When a system is out of certain parameters, a message is displayed in the CITS monitor at the aft station. By using certain codes, we can also check all kinds of neat stuff such as brake temperatures, bleed air temperatures, valve positions, your astrological sign, etc. The Electric Multiplex (EMUX) system manages the aircraft's electric load through the use of several black boxes (MUX boxes), with each box having a backup (redundancy box). In some systems, when we move a switch in the jet, all we are doing is requesting permission from EMUX to use that system. If the right conditions are met (airspeed, electric load, etc.), then EMUX in its great wisdom allows us to use that system (yes, this material is testable).

Our Defensive Systems Officer (DSO) notified the crew of the message and researched codes to verify the MUX status. The CITS then flagged a MUX 13 redundancy message signaling the total loss of the MUX 13 box and possibly some of the associated systems. We checked to see which systems might be affected. Among these were the hydraulic system and the landing gear. I immediately lowered the landing gear, obtaining good indications. The hydraulic systems showed normal pressure. We lost the Inertial Navigation System (INS), so we used the backup Gyro Stabilization System for navigation. At odd intervals, a handful of caution lights would flash in the pilot's master caution panel. They would flash so fast that we could not determine which lights they were. We decided that even though there were no steady caution lights and all systems looked good other than the INS, we would make one approach to a full stop. The DSO advised our command post of this and tried to get more specific information on possible effects of our problem. While the copilot flew the aircraft, I performed the necessary checklist items with the help of the Offensive Systems Officer (OSO) and the Instructor OSO (oh yeah, I forgot to tell you; this was back before we figured out flying 6 crewmembers with 4 ejection seats at .95 Mach was not such a hot idea). The DSO attempted

"We have no brakes!" I took command of the jet and applied the brakes with no response. I then told the copilot "Go to emergency."



the B-1 fix-all (reset) on the MUX system to no avail. The interval between the caution lights flashing seemed to decrease, so I elected to configure the aircraft early and fly the approach at flap limiting airspeed until 2 miles from touchdown. The copilot watered my eyes with an excellent landing; and at touchdown, CITS flagged the anti-skid system. I visually checked the anti-skid switch position and verified the anti-skid caution light was out. I had experienced this message at touchdown on several occasions with no actual malfunction, so I advised the copilot to continue with our briefed procedure of checking the brakes at the 7000 feet remaining marker. He also added a slight forward stick pressure for aerobraking until 40 knots below approach speed, when he applied full aft stick. At 7000 feet remaining, he checked the brakes successfully; and at the 5000 marker he applied the brakes again, slowing down below 50 knots. With 1500 feet remaining, the copilot attempted to slow down the aircraft to taxi speed to clear the runway. This time the brakes were inoperative and he announced "We have no brakes!" I took command of the jet and applied the brakes with no response. I then told the copilot "Go to emergency." He placed the emergency brake switch to Emergency, calmly announced the loss of brakes to the tower and requested fire coverage. With the emergency brake system, we had no anti-skid; so I tried to be gentle applying the brakes. However, as soon as I applied pressure with my size 11s, I heard

a loud bang and the aircraft started moving sideways toward the right edge of the runway with the tail skidding considerably. I released the brakes and attempted to engage the nosewheel steering, with no result. With both the departure and the right edge of the runway rapidly approaching, I slammed on the left brake and started to reach for the engine start and shutdown switches. The aircraft started to skid to the left and came to an abrupt stop about 100 feet from the departure end and 30 feet from the right edge of the runway. I was then concerned with the possibility of engine damage/fire from what I assumed would be at least one blown tire. While I questioned tower on any smoke/unusual indications, the Instructor OSO lowered the ladder and visually scanned the area. The OSO and DSO verified on CITS that the temperatures were normal. Tower personnel reported some white smoke had been seen before, but there was none now. This was verified by our fearless Instructor OSO, who also found no visible damage. We shut down the engines on the runway and the aircraft was towed to parking. All main gear tires were changed; however, there was no aircraft damage. Three were worn beyond limits and the side stress on the others had rendered them unusable. Besides scaring a few years off of my life, the incident really brought to my mind a few things that I had instructors drill to me and I passed on to my students.

Fly the Airplane

I have to admit, I relaxed some after we touched down and checked the brakes. However, when I heard the pilot's comment about the brakes, my adrenaline went back to where it was and then some. Even though you have landed the aircraft, there are a lot of things to be done before you can start patting yourself and your crew on the back. The brakes in this airplane work so well that 9 times out of 10 you have to add power to taxi to the end of the runway. Someone a lot smarter than me once said, "There is nothing more useless than the altitude above you and the runway behind you." You may think twice before trying to rush to get to the end of the runway to let the airplane behind you get a touch and go. I'd hate to think what could have happened if we had been going much faster or if the runway was wet, especially with the rubber deposits we then had at Base D. With the loss of MUX 13, the anti-skid system malfunctioned so that it released the pressure on the brakes. By selecting the emergency brake system, we deenergized the anti-skid system. The accumulators used for emergency braking can give us 7 to 14 applications. However, in this case, the engines were running and the hydraulic systems were operating normally keeping the accumulators charged; so we had unlimited applications available.

Know your Boldface

They are boldface items for a reason. With the end of the runway rapidly approaching, there was no time to think about the brake failure procedure. I cannot print the word that came to my mind after I stepped on the brakes with no effect, but the first words out of my mouth were the boldface I had written so many times for our beloved Stan/Eval types. Judging by the quickness of his reaction, I'm sure it was on the copilot's mind also.

When in Doubt, Get Help

Since the only system we had actually lost was the INS, I elected not to declare an emergency. The fire department responded in a short time, but it felt like an eternity for somebody sitting in a crippled jet. There are many things we have yet to learn concerning partial EMUX failures. It doesn't pay to underestimate EMUX. If some of your black boxes go TILT on you, maybe you ought to get as much help as you can.

The old adage that goes "Aviation in itself is not inherently dangerous; but to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect" still applies in our electric jets just as in any other aircraft. This is true not only for actual flying but also mission planning. When you are about to run out of runway is not the time to decide who is going to do what and when. Take your time in mission planning to decide how you will handle an emergency. You owe it to yourself. ■

FLY SAFE!

ACC RISK MANAGEMENT GUIDE

YOU MAKE A DIFFERENCE!
Prevent injury, damage, and mission degradation.
Eliminate, reduce, or control risk.
Apply risk management today.

In our business, our safety involvement must be more than investigating the crash site. We must **prevent mishaps while maximizing mission success.** To accomplish our goal, individuals at every level must understand risk management concepts and apply them to their part of the mission. Proactive leadership at every level is key to successfu l risk management.

RISK MANAGEMENT - Our mission depends on it!!

FOLD

RISK MANAGEMENT

A common sense way of accomplishing the mission with reduced risk.

A systematic process to help all individuals make sound decisions in a logical, timely manner.

A method of getting the job done by identifying areas that present the highest risk and taking action to eliminate, reduce, or control the risk.

Operational Risk Management (ORM) is extremely flexible and can range from a process taking only a few moments to a more expanded one taking several hours or days.

BENEFITS OF RISK MANAGEMENT

Enhanced Operations - Improve ability to detect and control hazards.

Increased Efficiency - Detect and eliminate ineffective or overly restrictive risk controls.

Combat Effectiveness - More assets that are better prepared. Concepts applicable in peace and combat.

Risk Management Goals

FOLD

PRINCIPLES OF RISK MANAGEMENT

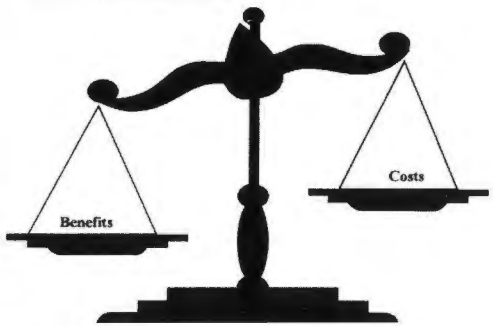
1. Accept no unnecessary risks -- those that have no benefit and clearly are not worth taking.

2. Make risk decisions at the proper level. Emphasize sound risk management at all levels; elevate, when necessary.

3. Accept risk if benefits outweigh the cost. We may have to accept significant risk to accomplish the mission, but it must be based on sound risk management.

INCORPORATE RISK MANAGEMENT IN ALL PLANNING

Integrate risk management into all phases of our operations. Include in ACC instructions.



RISK MANAGEMENT RESPONSIBILITIES

Commanders:

* Are responsible for effective management of risk.
* Select from risk reduction options provided by the staff.
* Accept or reject risk based on the benefit to be derived.
* Train and motivate leaders to use risk management.

Staff:

* Assess risks and develop risk reduction options.
* Integrate risk controls into plans and orders.
* Eliminate unnecessary risk restrictions.

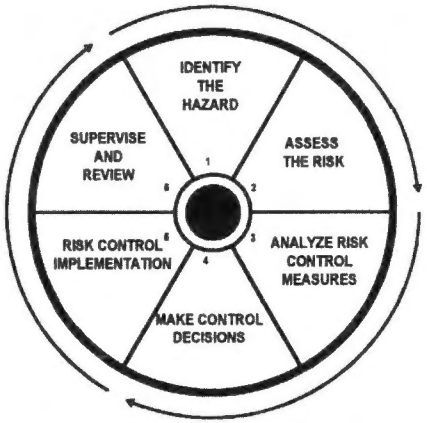
Supervisors:

* Understand the risk management process and encourage personnel to use it both on and off duty to reduce accidents.
* Consistently apply effective risk management concepts and methods to operations/tasks.
* Report risk issues beyond their control or authority to superiors for resolution.

Individuals:

* Understand, accept, and implement risk reduction guidance as appropriate.
* Maintain a constant awareness of the changing risks associated with the operation/task.
* Make supervisors immediately aware of any unrealistic risk reduction measures or high risk procedures.

THE RISK MANAGEMENT PROCESS



THE USAF ORM SIX STEP PROCESS

1. Identify the Hazards: Visualize the expected flow of events and identify any conditions which might result in personnel injury or death, property damage, or degraded mission performance. If some prior planning has been done, focus on changes in the operation from the original plan to help identify hazards.

* Identify the potential sources of danger which cause risk. Examples include: poor weather , deviations from a plan, or lack of adequate rehearsal.

2. Assess the Risks: Determine which of the identified hazards present the greatest risk, considering the potential outcomes and their probability and severity.

* Review hazards identified in step 1 and describe the overall impact using qualitative (numerical probability) analysis.

* Determine the level of risk associated with each hazard.

* Prioritize the hazards for action.

3. Analyze Risk Control Measures: Determine what controls can be implemented to counter the assessed risks.

* Avoid risk - Can high risk elements be eliminated without compromising objectives?

* Reduce risk - Can the mission be modified or changed to reduce the risk, perhaps by increased training or procedures.

* Spread the risk - Example: increase exposure distance or limit exposure time.

* Transfer the risk - Kill it with technology. Send the mission to a unit better suited to handle the task. Use a machine versus a person.

4. Make Control Decisions: Determine which courses of action will best accomplish the mission with an acceptable level of risk.

* Allocate the resources to the prioritized list of risks. Resources include: time, money and manpower .

* Resources should be allocated to improve the balance between benefit and risk. Avoid excessive resources to completely eliminate risks when a simple reduction is sufficient.

* Make decisions at the lowest possible level. Elevate to a higher level when necessary .

* Consider the following tools to aid the decision-making process:
  * Regulations and specific decision-level guidance.
  * Decision logic table.
  * Joint planning publications.
  * Risk management guidelines.
  * Lessons learned from previous operations.

5. Risk Control Implementation: Implement the controls and the courses of action decided on in the previous step.

* Controls may be substantial such as writing an instruction or as simple as conducting a safety briefing.

* Implement control measures in an organizational context. Get input from the field, make sure people will understand the control measures.

* Generate command commitment before implementation. Look for ways to demonstrate that commitment.

* Launch the option, provide visual aids, include in job guides. Be clear on who has responsibility for implementation at unit level. Provide a clear line of accountability.

* Design in ownership. Deploy with a plan to measure success.

6. Supervise and Review: Monitor the operation for effectiveness of the controls and changes. Correct ineffective controls and begin the ORM process again as further changes occur .

* Actions go beyond making sure people do what is expected of them. Actions include follow-up to evaluate and adjust risk management decisions and controls as necessary .

COMACC POLICY

I salute you for achieving our lowest ever Class A mishap rates for 1996. Now , we must find a way to achieve further dramatic reductions in our mishap rates. Operational Risk Management is the tool that will help us attain that goal. It is not a radical way of doing business; we have been applying ORM philosophy and methods intuitively and experientially for years. However, ORM now gives us the tools to systematically make dramatic reductions in our mishaps and improve operational effectiveness. I am counting on your support.


Fleagle
WE SURE IS EXPECTED TO READ 'AN CHECK A BUNCH OF PAPER EACH TIME A NEW BODY CHECKS IN.
I AIN'T GOT TIME TO READ ALL THAT STUFF. JUST GET BUSY. IF YOU NEED ANYTHING ASK ONE OF TH'GUYS.
BUT...
I THOUGHT TH' FIRST THING THESE FOLKS WANTED TO SEE WUZ MY AF FORM 55.
©STAN HARDISON 1997
FLIGHT LINE
WELL I FINALLY GOT FLIGHT 221 OFF TH'GROUND.
BUT WHAT DO I DO WITH ALL THESE PARTS I HAD LEFT OVER.
I DO BELIEVE FLEAGLE JUST DISCOVERED THE IMPORTANCE OF REVIEWING A NEW PERSON'S QUALIFICATIONS.
SO IT SEEMS.
HARDISON

FLIGHT SAFETY AWARD OF THE QUARTER

MSgt David A. Murphy
5 BW
Minot AFB ND

MSgt Murphy possesses a wealth of flying safety knowledge, has logged more than 5,000 hours an evaluator, instructor and crew member and is one of the original cadre of Flight Safety NCOs. Sgt Murphy hit the pavement running when he first arrived at Minot. He completely revised the 5th Bomb Wing Mishap Investigation Plan, Oplan 91-204-96, and the current Minot AFB BASH Plan. To accompany the BASH plan, Sgt Murphy coordinated meetings with the US Department of Agriculture representatives for North Dakota and organized a base survey of wildlife and wildlife habitat. He then used the data to formulate a plan to minimize the potential for a conflict between aircraft and wildlife. This included depredation permits, habitat control and scare-away techniques that are being used to control migratory bird populations at Minot AFB. Sgt Murphy greatly increased unit awareness of the hazards from bird strikes. His personal efforts to educate the aircrews, maximize reporting and improve bird control procedures resulted in an amazing 80 percent decrease in bird strike damage costs.

Sgt Murphy is a team player in every sense. He frequently assists the ground safety office with the investigating and reporting of ground mishaps along with assisting in the upgrade training of two three-level ground safety technicians. He is a staunch supporter of the whole safety office (Flight, Ground, Weapons, and Missile Wing Safety) working as a team to protect the resources and combat capabilities of Minot AFB.

Sgt Murphy is often the only person manning Flight Safety. Along with investigating flight mishaps, conducting spot inspections and conducting a unit self assessment, he still finds time to write monthly flight safety news articles and procure much needed equipment for the Safety Office. He took it upon himself to coordinate the buy of new office furniture for the entire Safety Office, new radio communication equipment and a desperately needed Flight Safety vehicle.

When it comes to mishap investigating and reporting, they do not come any better. Sgt Murphy has investigated five Class "C" flight mishaps and drafted nearly all of the flight mishap reports since arriving to the office. His tenacity assures his investigations are thorough, accurate and complete and reporting is prompt. Sgt Murphy's knowledge of safety related regulations is uncanny, and he is often consulted for expert advice. He still receives an occasional call from the Chief of Safety at his last duty station, requesting advice on BASH and C-9A related issues.

GROUND SAFETY AWARD OF THE QUARTER

MSgt James P. Raabe
28 BW
Ellsworth AFB SD

The 28th Bomb Wing Safety Office's vision is "Make Safety Easy"—MSgt Raabe has done just that! Extreme winter weather is a fact-of-life in this part of the country; Sgt Raabe has gone "above and beyond" to heighten awareness of the hazards and help our people manage the risks effectively. He coordinated with the Ellsworth Base Exchange manager to set up a "one-stop shop" for building a winter driving survival kit—got this publicized in a feature article for the base newspaper. His creation of *Ellsworth's Take-Along Winter Survival Handbook* was an innovative and pocket-sized booklet containing potentially life-saving information. Sgt Raabe also organized and served as emcee for the base-wide Holiday Safety Awareness Day, featuring presentations by the South Dakota Highway Patrol, base fire department and the base Safety Office. Result—our people received a critical safety message at exactly the right time, just before the holidays. He orchestrated numerous "moving parts" as project officer for a highly successful quarterly Safety Summit. These included: integration of statutory requirements like AF Occupational Safety and Health Council and Flying Safety Council into a coherent package; effective coordination with other base agencies to gather relevant data and present it to the wing leaders. The above accomplishments allowed the commanders to focus intensively on all aspects of safety in a single, interactive forum.

As investigating officer for a B-1B mishap, Sgt Raabe revealed training deficiencies among maintenance personnel. This action prompted the unit commander to solicit an anonymous survey of routine aircraft maintenance practices. Sgt Raabe prepared the survey instrument and interviewed a sampling of maintainers individually. The survey identified potential problem areas with training and its documentation, technical order interpretation, manning, experience levels and other human factors. As a result of Sgt Raabe's efforts, the unit commander is implementing a unique "maintenance safety" program to target deficient areas. To help jump-start this program, Sgt Raabe has engaged in an aggressive information-gathering effort. Sgt Raabe is a proactive leader, inside and outside the office, who strives for continuous self-improvement. In addition to supervising the activities of two other NCOs, he ensures ground safety awareness stays "in the news" by encouraging his people to write articles and conduct interviews for the base paper. After he observed some "best practices" during an inspection of one of our squadrons, he interviewed the commander to compile useful tips for eventual sharing with all unit safety representatives. Sgt Raabe is a true example of continuous improvement in the Air Force.

WEAPONS SAFETY AWARD OF THE QUARTER

SSgt Stanley G. Bottjen
86 FWS, 79 TEG
Eglin AFB FL

Sergeant Bottjen directly impacts the safe and successful execution of ACC's Air-to-Ground Weapon System Evaluation Program (A/G WSEP) through meticulous administration of the 86 FWS Weapons Safety Program. During A/G WSEP 97-01, he closely supervised the assembly, installation and testing of telemetry (TM) kits into 29 live AGM-65 missiles by members of the 354 FS, Davis-Monthan AFB AZ. He personally identified a critical clearance deficiency between the TM kit and an AGM-65G warhead allowing for immediate disposition of the faulty component. Challenged with a perplexing defective AGM-65/D rocket motor fire wire, he monitored its safe and expedient "on-aircraft" repair, saving 8 man-hours and guaranteeing unimpeded mission accomplishment. He also performed intricate preflight TM operational checks on all loaded missiles verifying proper tracking frequencies and advocating strict range safety specifications. Sergeant Bottjen's hands-on approach to every facet of A/G WSEP 97-01 produced a flawless and mishap-free evaluation. In support of William Tell 1996, his diligent safety inspections provided a safe Eglin AFB training environment for 6 F-15s and 40 personnel from Lakenheath AB UK, ensuring all 80 sorties flown were mishap free. His ceaseless interaction with the 53d Wing's Safety Office keeps him in tune with new and pertinent weapons safety information. He continually disseminates weapons safety information by conducting comprehensive safety briefings for 86 FWS personnel. He tirelessly maintains a continuity book and an extensive file of weapons safety publications in impeccable condition. He promotes an uncommon emphasis on weapons safety through innovative use of electronic mail and safety bulletin boards in three separate buildings. Sergeant Bottjen's endeavors were instrumental in the "Excellent" rating received during the Air Warfare Center annual safety inspection, earning him recognition as an "Outstanding Performer." The outstanding execution of A/G WSEP and preservation of Air Force resources are products of his weapon safety awareness which reflect his concerns for the welfare of people at Eglin AFB and its adjacent communities.

Captain Gregory D. Cox
33 FW/SEF
Eglin AFB FL

It Really Can Happen to Me!

Everyone knows safety is a stable job. All the procedures are long-standing and well documented. So when the instructors at the Air Force Safety Center (AFSC) said my wing Flight Safety Officer (FSO) job would be exciting, I chuckled to myself. Little did I know that my "wake up call" was about to come. I guess some people just have to get slapped in the face rather than take some "old-timer's" word for it. Well, anyway, this is my story...

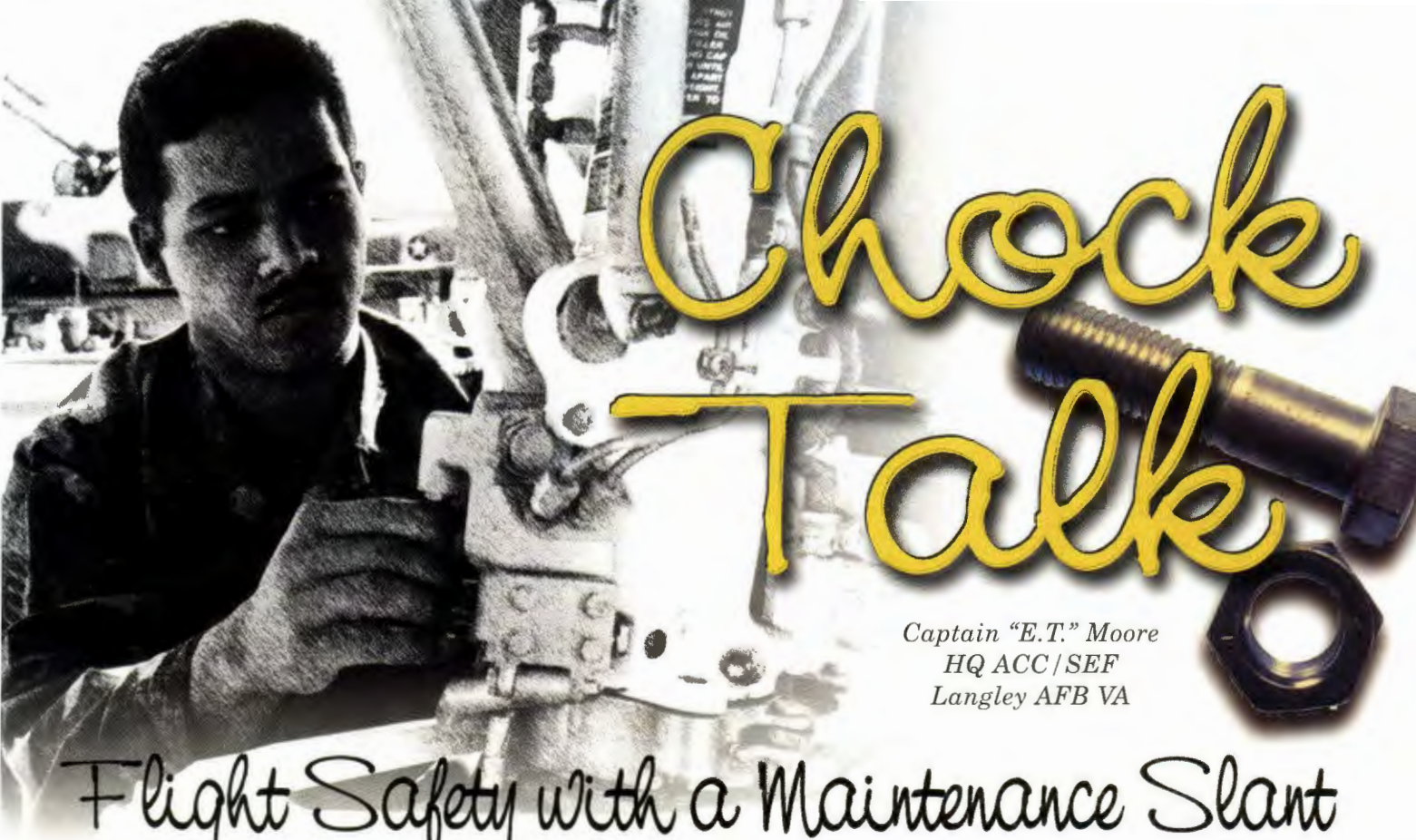
Upon arrival to the unit, my transition into wing safety went smoothly. I was fortunate to have an overlap of 2 months with the departing FSO. With the instruction I received at the AFSC FSO course coupled with my local safety officer training sessions, I felt I was ready to face any crisis. Sure, some of the documents and folders in my newly acquired position were out of date, but I would get to these in due time. Also, I had scheduled the required annual training for personnel assigned to be interim Safety Investigation Board (SIB) members. So, my new job was becoming just what I thought — routine.

One fateful morning, I rolled into work; and as I was getting out of my truck, I saw a large column of smoke billowing above the flightline. My initial thought was this is just another fire department training session. I quickly realized the gravity of the situation when the Flight Safety jeep went blazing by me with my Flight Safety NCO at the wheel. An aircraft had caught fire on the runway during takeoff roll. On top of all this, my Chief of Safety was TDY and the departing FSO had left the day prior. Now I was the "expert" for the wing. Very quickly, I wished I had spent more time preparing for this situation than I already had.

The most difficult point of the day was the first hour after the mishap. I was the guy in the hot seat; you know, the guy we all look at and say I'm glad it's not me! In this hour, I had to begin the investigation process, initiate reports, go to the battle staff, help the wing commander pick the interim SIB and answer the same questions to every agency or O-6 that could find my phone number. Finding the members of the interim SIB was very difficult. It seemed almost every name on my list was TDY, out-processing for PCS or on leave. And wouldn't you know it, one of the things I needed to update was the very checklist I needed to get me through this ordeal. I did manage to stumble through this situation. I was fortunate to have a wealth of experience in my office and throughout the wing. There were many times when I had too much help, but I would rather have that problem than not enough assistance.

I learned what many FSOs have learned before me. It can really happen to me...and YOU! All those people I met with mishap investigation experience are now on my list of potential interim SIB members. My personal phonebook has expanded to include everyone I spoke with during the investigation. I have reworked my checklist to reflect the things I needed and the lessons learned. In short, the biggest lesson I learned was that wise, old, Boy Scout motto — **Be prepared.** Many of us have been lulled into complacency by the outstanding safety programs that have been left by those before us. The reality of our profession is "Mishaps Happen." If your wing ever experiences a Class A mishap, it will be when you least expect it. So, now is the time to blow the dust off of your Mishap Response Plans and checklists. You might just find some room for improvement. ■

it really can happen to me!



Chock Talk

Captain "E.T." Moore
HQ ACC/SEF
Langley AFB VA

Flight Safety with a Maintenance Slant

Back when the command's safety magazine was called TAC Attack, "Chock Talk" was a regularly featured article. It contained safety snapshots from across the command with a maintenance slant. As the sole aircraft maintenance officer in a shop full of aviators, I've been searching for an avenue to get the word out to my fellow maintainers on those flight safety issues that warrant our attention and in some cases our action. I think I've found it in a return to "Chock Talk."

Each month, I plan to highlight maintenance lessons learned from two or three aircraft mishaps or "close calls"...from a maintenance officer's perspective. My job here at HQ ACC allows me access to dozens of mishap reports from full up Class A's to High Accident Potentials (HAPs). Many of these contain one or more lessons learned from a maintenance perspective. The wing level maintainer seldom gets to see these reports much less apply any of the lessons therein. This column gives me the opportunity to pass these lessons learned on to maintenance leadership as well as the

troops on the ramp bending wrenches.

My hope is these tidbits will be discussed during safety days, roll calls and even morning production meetings. If it saves one jet or makes that young airman think twice before removing that Line Replaceable Unit (LRU) without tech data, then this effort is worth it. Maintenance leaders have a part in this effort also — if you have any close calls or lessons learned to share with the command, please drop me a few lines or give me a call. I'd be glad to share your experiences with the rest of the command. Safety privilege applies; that is, no names or base will be mentioned. Our goal here is mishap prevention. I can be reached at DSN 574-7031, or e-mail me at mooree@hqaccse.langley.af.mil. I'll close with the words I gave to my maintainers at the close of every production meeting: "Not a single sortie we fly is worth compromising the integrity of an aircraft or the life of a pilot."

INTAKE INSPECTIONS

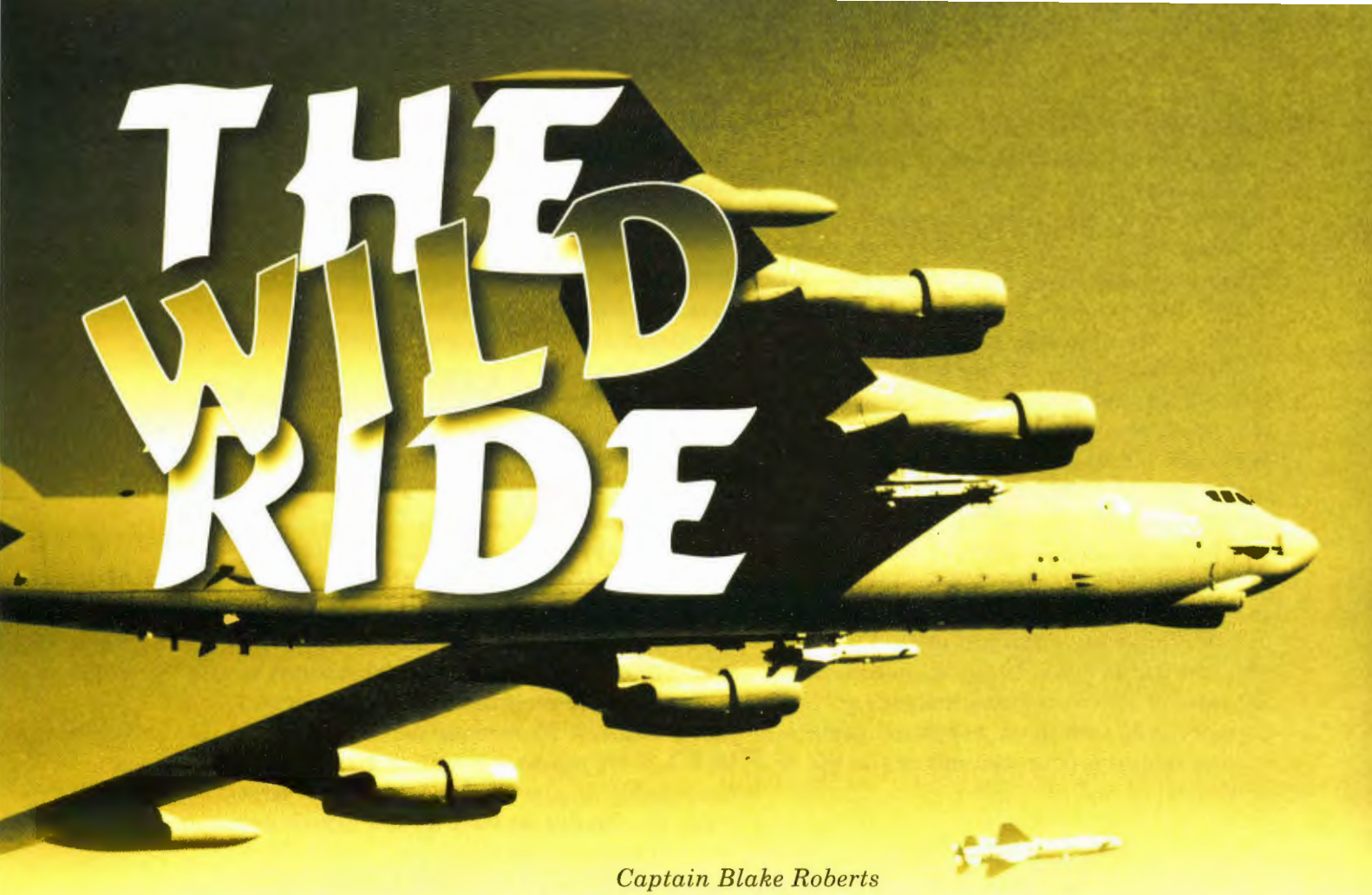
The F-16 Fighting Falcon (or "Viper," as we maintainers affectionately know it) is the finest fighter in the world. Without argument, the Viper is the safest single seat, single engine fighter in USAF history. It has also made leaps and bounds in the maintainability arena. However, recent Class A mishaps highlighted the critical nature of thorough intake inspections on this *single engine* aircraft. One of these incidents involved an aircraft that received a Foreign Object Damage (FOD) nick on the engine's first stage fan blade. The defect was detected and an attempt was made to blend out the nick. Unfortunately, the blend was incomplete and the remaining blade surface defect progressed into a fatigue crack. The fatigue crack continued to propagate eventually resulting in blade liberation. Unfortunately, the blade liberation took place in flight and resulted in catastrophic engine failure.

The Safety Investigation Board (SIB) determined that the fatigue crack on the first stage blade may have been visible to the naked eye up to 80 sorties prior to the mishap. Folks, that's as many as 160 intake inspections that missed this critical defect! The SIB sampled several units to determine the average time it was taking a crew chief to perform an intake inspection. While the workcard allots 16.1 minutes for a complete intake inspection, with 11 minutes dedicated to the front frame, Inlet Guide Vanes (IGVs) and Fan Blades (concave and convex sides), the measured intake inspection times varied from 50 seconds to 6 minutes 52 seconds, with an average of just 2 minutes 29 seconds per crawl! Let's face it, 2 1/2 minutes is not enough time to thoroughly inspect both sides of 32 first stage fan blades as well as the remainder of the intake. But wait, there's more! Mirrors and flashlights were not used. These are now required by technical data. Intake inspections may border on the dull and routine for the average crew chief. However, the criticality of good thorough inspections cannot be overstated.

One final note, another recent mishap board has reported evidence of inadequate intake inspections. This time, the SIB noted intake inspections being signed off without ever being accomplished. Folks, now we are talking about more than just complacency - - we are talking about integrity. Flightline leadership must play an active part in correcting this behavior! Don't let the pressure of "turning the jet" keep you from doing your job right and by the book. ■

"Not a single sortie we fly is worth compromising the integrity of an aircraft or the life of a pilot."

THE WILD RIDE



Captain Blake Roberts
20 BS/DOT
Barksdale AFB LA

There we were, number two in a two-ship formation departure for a routine 7.5 hour training mission. Onboard, we had a basic crew of five plus our Chief of Stan/Eval to get AGM-142 training. Takeoff was uneventful up through about 50% flap retraction. It was then, at approximately 1500' AGL (Above Ground Level), that the aircraft started pitching up and down. My first thought was that we were in lead's wake turbulence, so we climbed to get above it. The pitching continued, getting progressively worse as the aircraft accelerated through flap retraction, but I could see that we were well above lead's jet wash. The violent pitching had locked our parachute inertial reels pinning us in our seats, making it impossible to reach anything out of arm's length. As the flaps came fully up, the aircraft stopped pitching for roughly 10 seconds. In that time, I rolled right to get cutoff on lead who had made a 90 degree turn towards the departure point. Suddenly, the pitching began again, getting more and more violent as I accelerated towards my 280 knot climbout airspeed.

All three pilots frantically scanned the cockpit, trying to figure out what was going wrong. I thought we might have had a flap problem or catastrophic engine failure. Everything appeared normal on all the gages; so the copilot and I checked outside looking for some sort of structural damage, but everything looked normal. Even the AGM-142 missile and pod were amazingly still there. After about 90 seconds, the aircraft slowly became almost uncontrollable. I looked over my shoulder to see the Chief of Stan/Eval in the Instructor Pilot (IP) seat unstrapping from his parachute and heading for the open ejection seat in the defensive compartment. We were amazed to hear later that he actually made it back there and got strapped in despite the lurching aircraft. If you can imagine going from

+3 G's to -1.2 G's and back again every second, you're getting the picture. It was all I could do to hang on to the yoke as the aircraft tried shaking the teeth from our heads. Aircraft placard limits at that gross weight are +2.0 to -0.66 G's; so needless to say, we were a bit worried about the structural integrity of the jet.

Something made me look down and fixate on the yaw and pitch Stabilization/ Augmentation System (SAS) switches as my mind was racing between finding a solution and preparing to use my ejection seat. The only problem was that I couldn't reach them due to my locked inertia reel. I obviously had my hands full of jet, but I couldn't give the aircraft to the copilot since communication of any kind was impossible. So, I rolled the aircraft wing's level and tried to unlock the inertia reel. After finding it amidst the bucking aircraft, I was able to unlock it for the split second that it took to lean forward several inches before it locked again. I was just able to reach the yaw and pitch SAS switches now and slap them off. Just as quickly as it began, the wild ride ended.

It was very quiet on the plane for about a minute as everyone regained their composure, realizing just how close we all were to giving this jet back to the taxpayers. I had to admit this was the first time I had ever seriously given consideration to using the silk elevator. My offense and defense teams had all assumed the positions and had their hands on their trigger rings/arming levers waiting for the bailout call. "Another 5-10 seconds of that" they said, "and we would have been gone." In the B-52's Technical Order (T.O.), there is a warning that reminds crewmembers occupying ejection seats of "the urgent need for action when the aircraft commander fails to or is unable to command bailout." This warning had flashed through everyone's thoughts.

Four and a half hours and 200,000 pounds of JP-8 later, we landed uneventfully after conducting a controllability check. The jet was impounded and maintenance is conducting extensive structural integrity checks of the entire airframe before it can ever fly again.

Lessons Learned

Looking back, in that perfect 20/20 hindsight, the confusing factor was that the flight controls were not acting abnormally. The yoke was perfectly still, the stabilizer trim wasn't running and the autopilot was not engaged. Evidently, the pitch electronic control unit was inputting erroneous full elevator deflections without the aircrew's knowledge. Although there is a warning about unscheduled pitch oscillations in the T.O., there is no boldface for this situation in the B-52 world. If I am ever unfortunate enough to encounter this again, you can be sure that warning will be the first thing that runs through my mind. To me, the yaw and pitch SAS systems were always benign entities that were just there to dampen out unwanted oscillations. I will think twice now as I reach down to engage the yaw and pitch SAS switches prior to flight. For those of you out there in other weapon systems, there could be a lesson here for you, too. Your aircraft may also have subsystems that can make inputs to your control surfaces without your knowledge. Learn about them and be prepared to react!

At our latest wing hangar fly, I debriefed this incident to all aircrew members in the wing in hopes that if this ever happens again, the knowledge base will be a little broader. I was very fortunate on this ride. The Central Flight Instructor Course (CFIC) old motto of "fly the aircraft" held true again! Things were a little unnerving for a while, but I continued to fly the aircraft until we figured it out. In this world of new is better and smarter, some of the old ways still serve us quite well! ■

Note: The author and aircraft commander, Captain Blake Roberts, was a 20 BS Training Flight Instructor Pilot on his next to last B-52 sortie when this incident occurred. He has since joined the 12th Airborne Command and Control JSTARS Squadron at Robins AFB GA.

- Ed.

ACColades

QUESTIONS OR COMMENTS CONCERNING DATA ON THIS PAGE SHOULD BE ADDRESSED TO HQ ACC/SEF, CAPT "E.T." MOORE DSN: 574-7031

	TOTAL			ACC			CANG			CAFR		
	MAR	THRU MAR		MAR	THRU MAR		MAR	THRU MAR		MAR	THRU MAR	
		FY97	FY96		FY97	FY96		FY97	FY96		FY97	FY96
CLASS A MISHAPS	2	9	6	0	2	3	1	4	3	1	3	0
AIRCREW FATALITIES	1	12	0	0	0	0	1	2	0	0	10	0
* IN THE ENVELOPE EJECTIONS	1/0	7/0	4/0	0	1/0	2/0	0	3/0	2/0	1/0	3/0	0
* OUT OF ENVELOPE EJECTIONS	0	0	1/0	0	0	0	0	0	1/0	0	0	0

* (SUCCESSFUL/UNSUCCESSFUL)

CLASS A MISHAP COMPARISON RATE

(CUMULATIVE RATE BASED ON ACCIDENTS PER 100,000 FLYING HOURS)

ACC	FY 96	0	1.1	0.8	0.6	0.9	1.2	1.0	0.9	1.0	1.4	2.1	2.0
	FY 97	0	0	0	0.6	1.0	0.8						
8 AF	FY 96	0	0	0	0	0	0	0	0	1.2	1.0	1.7	1.5
	FY 97	0	0	0	0	0	0						
9 AF	FY 96	0	0	0	0	0	1.1	1.0	0.8	0.8	2.1	1.9	1.8
	FY 97	0	0	0	1.7	1.4	1.1						
12 AF	FY 96	0	3.4	2.4	1.8	2.9	2.3	2.0	1.7	1.5	1.4	3.1	2.9
	FY 97	0	0	0	0	0	0						
DRU	FY 96	0	0	0	0	0	0	0	0	0	0	0	0
	FY 97	0	0	0	0	5.7	4.7						
CANG	FY 96	0	1.9	1.3	2.2	1.8	2.2	1.9	1.7	2.0	1.8	2.0	1.9
	FY 97	0	3.8	2.6	3.3	2.7	3.0						
CAFR	FY 96	0	0	0	0	0	0	0	0	0	0	0	0
	FY 97	0	6.3	4.2	3.1	5.2	6.1						
TOTAL	FY 96	0	1.3	0.9	1.0	1.1	1.4	1.2	1.0	1.2	1.1	1.9	1.8
	FY 97	0	1.9	1.3	1.7	1.9	2.0						
MONTH		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP

(BASED ON HOURS FLOWN)

Safety's Final Factor

Chaplain Thomas P. Azar, 35 FW/HC, Misawa Air Base, Japan

Mishaps, minor and major, can occur anytime. What causes mishaps? Is it strictly the resource, technician or environment — or is it a combination of all three? If the latter is true, then with proper awareness we can reduce mishaps and ultimately loss of life. The following brief story will highlight the importance of what is called the "final factor."

Just as many streams make a river, many ingredients go into causing a mishap. Regardless if you fly aircraft, maintain electronic equipment or work as a police officer or cook, it is possible to decrease mishaps and injuries by examining the events, individuals and resources that complement one another as they cross the same path.

SCENARIO

"Phil Smith" is driving home with his wife and two children from a squadron party. It is just after 7:00 at night, dark, rainy and there is construction equipment alongside the upcoming hill. Phil is tired from a long week, finished off a few beers and is distracted by his daughter's crying. His vehicle needs maintenance. His worn tires lack good traction and the ripped wipers greatly reduce his visibility. The street lights are off due to construction and Phil is on the borderline of safety. Still, he is "safe" as these factors merge.

Suddenly, a large dog jets across the street shocking Phil. He has met the "final factor." He slams on the brakes, swerving to avoid the canine, only to fly out of control. The combination of rain, worn tires and wipers, alcohol, noise distractions, no street lights and road construction all merge at one place and time, making this a potential mishap in progress. The unexpected appearance of a dog running across the van's path pushes the Smiths over the safety line.

If the dog had never appeared, the Smiths would probably have made it home. Mishaps are unexpected and unintentional. Reviewing the "where," "what" and "who" of this trip — "where" one is going, "what" condition the vehicle and environment are in, "who" is behind the wheel — will help highlight potential "final factors" to prepare for.

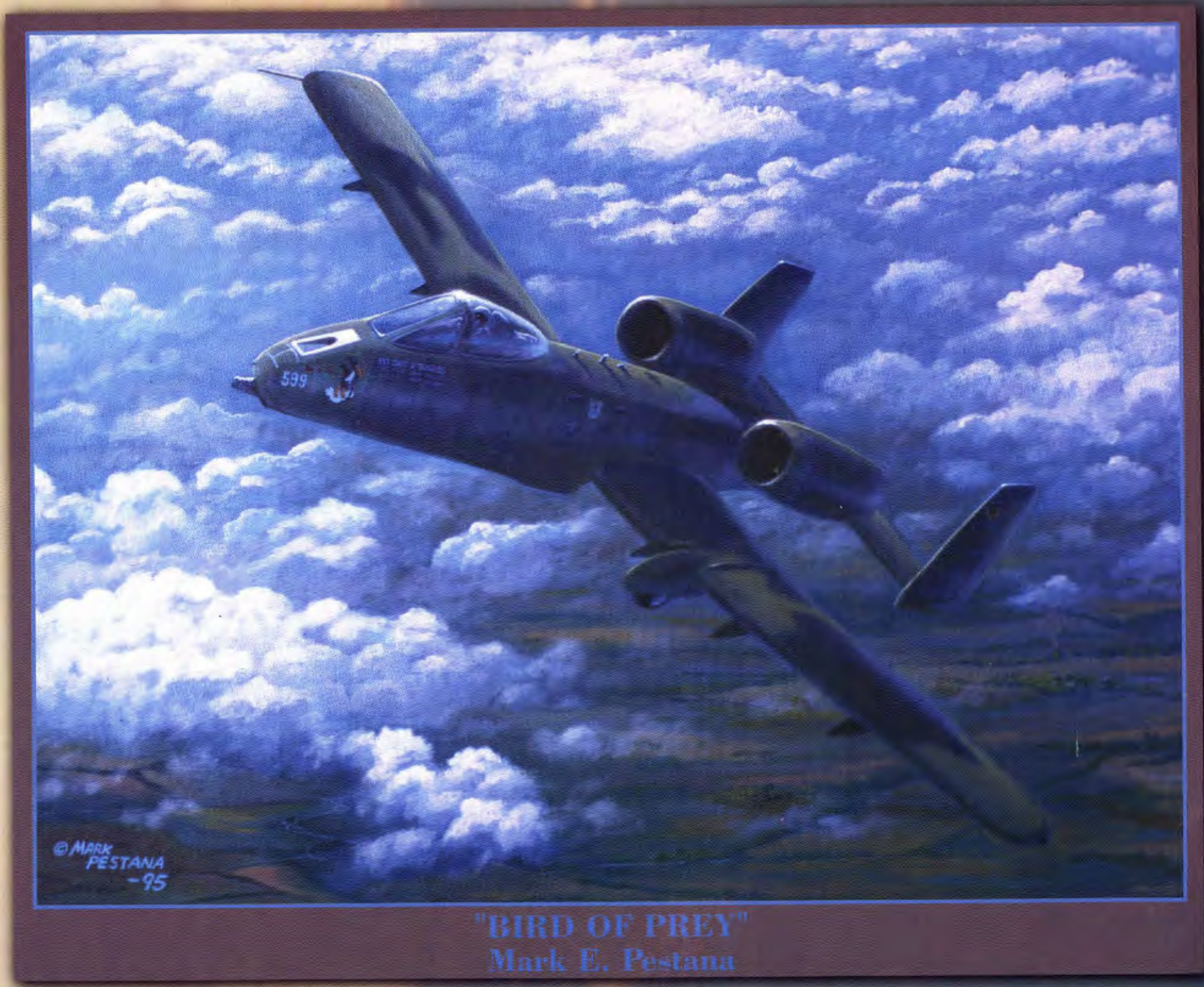
Whether you are a police officer on patrol, a maintainer working on an aircraft or a pilot preparing for takeoff, all of us need to forecast potential combinations of known and unknown factors. Moreover, share them with your peers in staff meetings or unit briefings. Review the "where," "what" and "who" before crossing the danger line into the notorious "final factor."

RECOMMENDATIONS

- Stay alert for the final factor. Evaluate the resources, environment and human elements that can come together and possibly cause an accident.
- Be prepared for the unexpected — train knowing that there is a final factor waiting around the corner. No need to be paranoid, just prepared.
- Read and study safety articles and brief coworkers on the variety of factors that contribute to safety mishaps. (Note: Air Combat Command's mishap prevention magazine, *The Combat Edge*, is an excellent source for this type of material.)
- Finally, don't be "penny wise and pound foolish." Never take short cuts in an effort to save a few dollars. A human life is priceless. ■

Sounds amazingly like Operational Risk Management (ORM) from a slightly different viewpoint. If Phil had simply followed the first three steps of the risk management process (identify, assess and analyze), he could have then made a sound control decision (Step 4) that when implemented (Step 5), would have prevented this mishap and avoided the "final factor" effect. The sixth step in ORM is to periodically review the operation to ensure your control measures are working.

- Ed.



"BIRD OF PREY"
Mark E. Pestana