

THE COMBAT EDGE

SEPTEMBER 1992



Photo By
TSgt Steve Turner
Langley AFB VA

photo by TSgt Steve Turner Langley AFB VA



THE COMBAT EDGE

Air Combat Command
Safety Magazine

Page 4

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4

A BETTER IDEA
Maj Gen Brown

6

IT'S UP TO YOU

8

AIRSPACE RECLASSIFICATION

10

SEATBELTS SAVE LIVES

12

PROCEDURES?

don't need them, I'm an aircraft commander

14

DO THE RIGHT THING

15

HEAR YE... HEAR YE

18

FATIGUE MANAGEMENT

22

KEEPING YOUR HEAD ON STRAIGHT

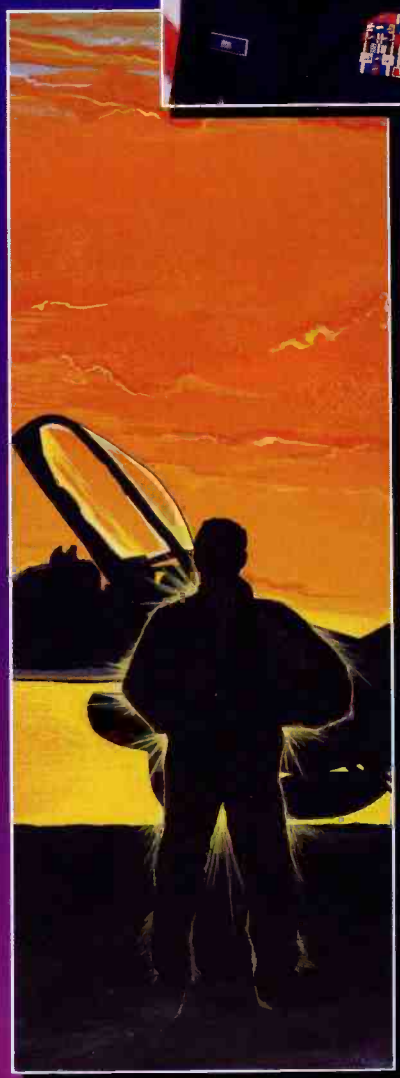
24

CAN'T DO

29

ONCE UPON A TIME

Page 29



ABOUT THE COVER

Two F-15s from the 1st Fighter Wing provide a friendly escort to a Russian Il-76 Candid and two Su-27 Flankers. The 1st Fighter Wing, Langley AFB, Virginia, played host to the Russians on a five-day goodwill visit. Photo taken by TSgt Steve Turner.

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VOLUME 1

ISSUE 4

ACCent on Safety

ACC's passion for excellence and quest for quality touches us all as we search for ways to improve the efficiency and effectiveness of our operations. While we strive for continuous improvement, safety considerations must be involved in everything we do -- not because it is a "program" or the "safety thing," but because it's the **right** way, the **smart** way to operate. We don't want to lose people, planes, missiles or other resources needlessly.

ACC safety goals emphasize a continued reduction in weapons and ground mishaps and specify an overall flight mishap rate below 2.0, with a command-controlled rate below 1.5. A mishap is labeled command-controlled any time a person wearing an ACC patch could have prevented the mishap or interrupted the sequence of events and did not do so. We are striving to meet these goals through proactive programs, involvement and teamwork. However, the primary goal of safety is not a low mishap rate; it's survivability. While we may be tempted to focus on statistical descriptions of how we're doing in preventing mishaps, what really counts is the aircraft, weapons, and people needed to get the maximum number of successful sorties airborne and back again -- combat capability. That's what our command is all about -- Air Combat Command professionals providing the world's best combat air forces delivering rapid, decisive airpower anytime, anywhere.

Commanders are the key to our safety program and

the preservation of our combat assets. Leadership, involvement and accountability are the essential elements for fostering an environment where a pervasive culture of safety flourishes. However, our culture of safety isn't just the commander's responsibility. It involves everyone at all levels. It is proactive in nature and based on a close association between workers, supervisors and leaders, with empowerment and recognition of performance and ideas as keystones.

Safety is most effective when it is an integral part of our routine operations -- not just a slogan. Our safety culture minimizes risk by modifying our actions and behavior until the safe way becomes second nature. We do things the safe way without even thinking and we train our new people to do the same. Teamwork, leadership, involvement and caring form the foundation of this culture. Each of us should be building upon that foundation to make our safety culture the best it can be. Commanders, supervisors and workers at all levels must "walk the talk" if we are to keep our culture of safety a vibrant, living entity. **The rewards are great!**



Colonel Bodie R. Bodenheimer
Chief of Safety



A BETTER

It may seem impossible today to achieve a near zero accident rate in the future -- but I believe it can be done.



Major General Lester P. Brown, Jr. *A better idea*
Commander, 1 AF
Tyndall AFB FL

The safety business, particularly flying safety, has its share of hackneyed expressions and outdated phrases. For example: "You gotta expect a few losses in a big operation." That idea, or the mind set it represents, provides a telling bit of insight into our natural tendency to accept things as they are, despite the fact that the consequences of a "few losses" can be catastrophic. Clearly this attitude requires an adjustment, especially in the area of flying operations.

We've got to have a better idea -- and we do. However, a better idea frequently meets with strong resistance because of a culture's preconceived values and comfort with its routines. "Because that's the way it has always been done" is another trite phrase that serves to illustrate how entrenched old philosophies can become in our daily lives. It simply seems more comfortable and less risky to continue to do things as they've always been done than to "rock the boat" with new ideas.

Total Quality (TQ) is an exciting new concept the Air Force has recently embraced to improve efficiency and effectiveness, and to produce a better quality product at all levels. As with all new ideas, TQ has met with a certain amount of natural resistance caused mainly by the inertia of "doing business as usual." However, the "quality" idea is overcoming this and rapidly taking hold throughout the Air Force. It is becoming more readily accepted than any other previous philosophical change, primarily because its implementation is focused on the "grass roots" level. Across the entire Air Force spectrum of missions and rank structure, the quality process is encouraging the people who do the work to make changes and improvements in the way it's done. By empowering the individual, this philosophy makes the acceptance of change a rational decision which can

IDEA

benefit the organization as well as the person. It is a fundamental change to our culture -- and it works!

This sweeping cultural change has already produced rather dramatic results in such obvious areas as industrial production, but we must not limit its application to those areas. I believe flying safety offers some fertile ground for applying the "spot-light" of TQ to achieve some significant improvements. In World War II we lost more aircraft and aircrews in training than we did in combat. Granted, the final combat kill ratio was greatly in our favor, and we managed to outlive our adversaries, achieve air superiority and eventually win the war. However, our losses of aircraft and aircrew to accidents were astounding by today's standards. The accepted philosophy at the time was that flying was a dangerous business and therefore we must expect losses. Eventually, after World War II the accident rate was brought down from hundreds per 100,000 flying hours to today's generally accepted 2.5 plus or minus 0.5 per 100,000 hours. That's fine, but should we continue to consider this an "acceptable" rate? Who has decreed that the command-controlled rate cannot be closer to zero? Let's use the already proven quality principles to find safer ways to accomplish the mission. It's a new idea -- maybe radical -- and nearly all new ideas are initially viewed with suspicion, but we know TQ works.

If we seriously apply the TQ principles of con-



tinuous improvement throughout our operations, it should naturally spill over into flying safety in the form of reduced accident rates. The logic here is that, by ensuring that our people, materials, training, aircraft, maintenance, procedures, airspace, and training aids (ACMI, simulators, etc.) are top notch, we should be able to improve the quality of our output across the board and achieve lower accident rates in the process. In the 50's and 60's, few would have believed we could reduce accident rates to their current levels. Carrying that a bit farther, it may seem impossible today to achieve a near zero accident rate in the future -- but I believe it can be done.

The process of continuous improvement focuses on a constant search for better ways to do our job. By planning, doing, checking and analyzing (PDCA), we can improve our entire approach to safety. Attaining an accident rate near zero will require time and energy, but it is a worthwhile undertaking. By focusing on ways to enhance the quality of our training, maintenance and equipment within a culture of continuous improvement, I believe we can drive the rate steadily downward. We owe it to ourselves to make the effort to prevent those "few losses." ■

IT'S UP TO YOU

*Capt Mike Peel
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The alarm clock goes off at 0600, and you slowly drag yourself out of bed to go on yet another alert. You're going to your home site; and even though you dread the two hour plus drive, you don't mind too much because it's usually a quiet alert. During the pre-departure briefing, you find out that you will have maintenance on three of your Launch Facilities (LF) today and a communications team in the Launch Control Center (LCC). Well, so much for a quiet alert. After the long drive, you pull up to the Launch Control Facility (LCF) fence and see two evaluators anxiously awaiting your arrival. Your heart skips a beat. You realize that you are about to experience the dreaded "no-notice evaluation." You ask your deputy if he posted the last T.O. change and he responds with a hesitant, "I think so." "Let's do everything by the book today and we'll do fine," you reply. Suddenly you realize it's been a very long time since you and your deputy did anything "by the book." You can't even remember the last time you did crew self-study. You think to yourself, "O.K., today we'll use the checklist for everything."

Has this ever happened to you? Hopefully not. If it has, you most

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"Let's do everything by the book today and we'll do fine," you reply. Suddenly you realize it's been a very long time since you and your deputy did anything "by the book."

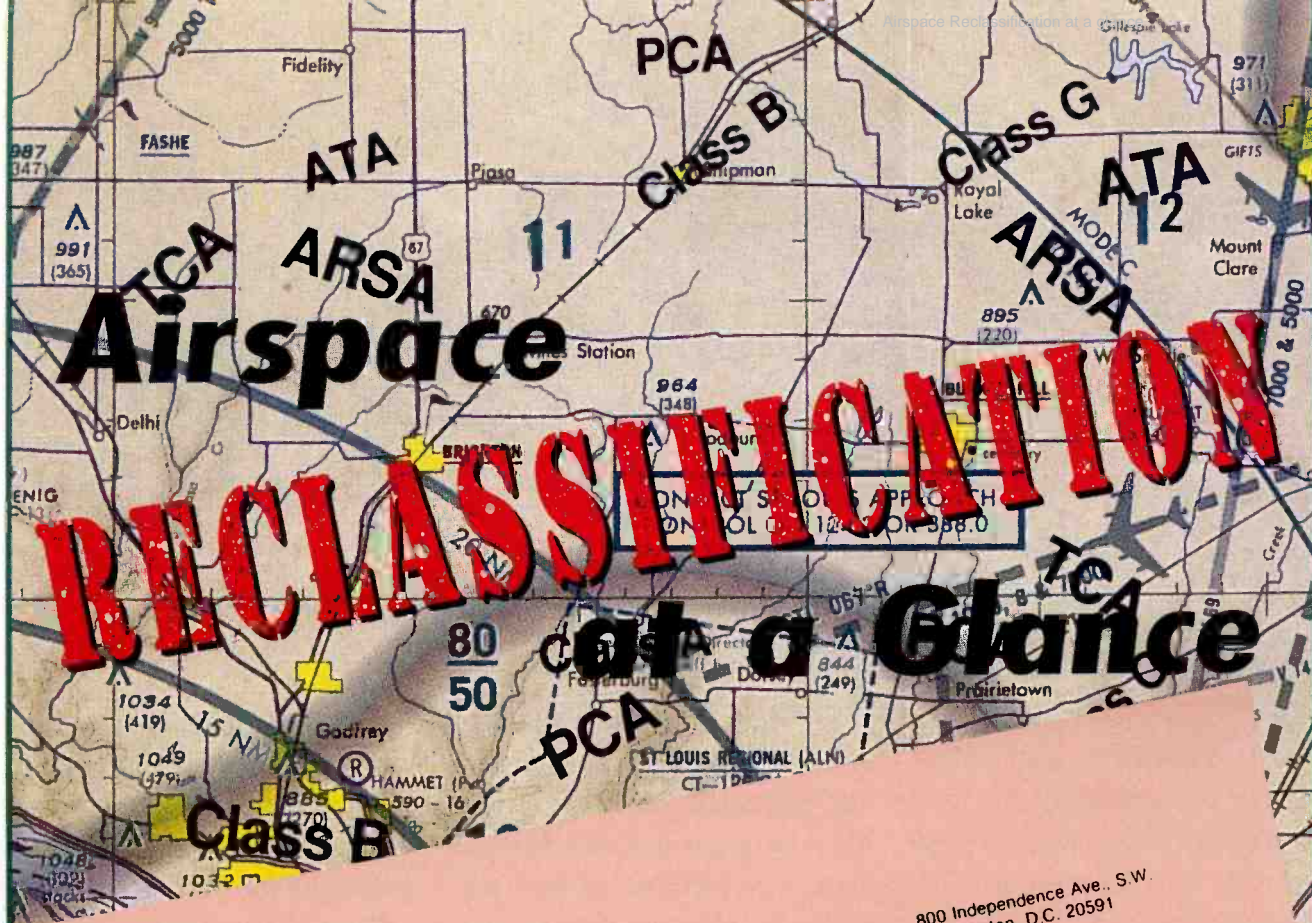
likely got through the field and Missile Procedures Trainer (MPT) phase of your check with less than outstanding results. Yes, you were probably rated qualified, but you know you're better than that. Where did this crew go wrong? You can narrow it down to two things: lack of crew self-study and failure to use the T.O. on a consistent basis -- either of which an evaluator can recognize almost immediately.

In these times of budget cuts and changing roles for the military, it's easy to develop a negative attitude. You lose sight of the mission and your performance begins to slip a little. Yes, most alerts can be dull and boring, but you must keep your proficiency at a high level. You have to be prepared for any situation. If you react incorrectly, you could damage critical equipment, injure yourself or others or prevent the wing from carrying out its war-time mission, all of which reduces the integrity of the deterrent force.

Many times in an MPT evaluation, you're presented with status and conditions that you are unlikely to encounter on alert, but must be prepared to handle. One of the purposes of training and evaluation is to ensure you can react correctly in the event of a "worst case scenario." Even with this in mind, there's no way your crew can be trained and evaluated on all possible scenarios you could experience while on alert -- the system is just too complicated. That's why crew self-study is so important. You have to sit down with your crew partner and discuss how you will run T.O. checklists and react to various conditions. It's also important to know how the system works, not just how it operates. With an in-depth understanding of how the system works, you can apply what you have learned to many different circumstances. There's a wealth of information in your T.O., but you can't find all the answers there. If you have a question and

the T.O. doesn't provide an answer, you have to take the initiative -- ask an instructor or a job control technician. It's the only way to truly learn the weapon system.

The Air Force has entrusted you with an awesome responsibility, and the tolerance for incidents involving nuclear weapons is extremely small. Perfection is the standard. Being a missileer has never been glamorous or easy. We've always had to find personal satisfaction in a job well done. The ICBM force is and always has been one of the most important facets of our military's deterrent force. Even though there is no clear threat today, missileers must be prepared at all times to carry out their peacetime and war-time mission. The job requires as much vigilance, hard work and attention to detail as it did during the height of the cold war. Now, as always, **it's up to you** to preserve pride in your work and maintain your proficiency. ■



U.S. Department
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Federal Aviation
Administration

800 Independence Ave., S.W.
Washington, D.C. 20591

July 31, 1992

HQ Air Combat Command
ACC/SEF
Chief of Flight Safety
Langley AFB, VA 23665-5563

On September 16, 1993, U.S. airspace will be reclassified. The enclosed pamphlets were developed by the Federal Aviation Administration as an aid in understanding the new airspace designations. Please disseminate the pamphlets and information. If you desire additional pamphlets, please call me at (202) 366-6164 or write to the following address:

Federal Aviation Administration
Safety Promotion and Special Projects Division/ASP-200
800 Independence Avenue, S.W.
Washington, D.C. 20591

We are in the process of producing a videotape which also outlines the reclassification. I will forward a copy of the tape as soon as it is available.

Alfred E. Stanton

Alfred E. Stanton, LTC, USAF
Aircraft Safety Officer
Associate Administrator for Aviation Safety
Safety Promotion and Special Projects Division

Seatbelts Save Lives

We've all seen films, attended safety briefings and heard stories about seatbelt use. Most of us recognize the common sense in wearing them, but I suspect that there are still some who have not gotten the message. Some may think they bind, restrict and are uncomfortable. Others may think it is safer to be thrown clear of the vehicle rather than being trapped. Now, before you say, "Oh no, not another seatbelt article," I think you should read a couple of stories that may change your mind.

In 7 years of missile duty, I have been to Sicily with the Ground Launched Cruise Missile (GLCM) system and to Missouri with the Minuteman II. My first story is about Sicily.

I had been in Sicily about 6 months on my initial missile assignment as a GLCM launch officer. We routinely deployed to a field training location 50 miles NE of Comiso AB. We convoyed to the site escorted by Italian Carabinieri military police tasked with keeping civilian vehicles from interfering with our convoy. We would conduct our exercise and then convoy back to base. On this particular exercise, all passenger seats in the convoy were filled with exercise personnel. There was no room for extra personnel to "hitch" a ride, as was a common occurrence. One of our medics, "Doc," a 15-year MSgt, couldn't find room up front in any of our 2-1/2 ton trucks; so he decided to hitch a ride in the back of the truck, which was not equipped with seatbelts or personnel seats.

The roads in Sicily are narrow and lined by walls on both sides. In some areas, however, the road runs alongside very steep cliffs. There is no room for error when driving these roads, even in the best of conditions.

It rained the night before, and in some places the

road was very slick with standing water. We started our trip with a convoy spacing of roughly 200-400 feet between vehicles. We had a Carabinieri motorcycle patrolman escorting the lead vehicle, one at the rear of the convoy and one alongside to prevent civilians from weaving in and out of the convoy. About half way home, a local driver cut in front of the 2-1/2 ton truck carrying Doc. The military driver slammed on his brakes, and the vehicle slid about 200 feet coming to an abrupt halt on the side of the road. Doc was thrown out of the back of the vehicle and sailed over the side of the road, falling 100 feet down the cliff. The convoy immediately stopped and our other medic climbed down the cliff, reaching Doc 5 minutes later. Doc landed hard, hitting his head on a large rock and died within 10 minutes.

Doc's funeral was 3 days later. Everyone in the convoy attended, many with unanswered questions: Who was responsible for the accident? How much blame could be placed on Doc for riding in the back of the truck? That he should have been wearing a seatbelt is obvious. He probably should have waited until we found room for him in a smaller vehicle. A lot of "should haves" occurred that day. As a result of the mishap, the base changed its policy. Passengers were forbidden in the back of 2-1/2 ton trucks.

I was driving my POV to a launch control facility; the weather and road conditions were perfect. I crested a hill traveling too fast for the very sharp curve ahead. I had missed the curve warning sign. The next few seconds flew by. As I tried to negotiate the curve, the right wheels of the car departed the pavement and contacted the gravel shoulder. I was off the road only a second or two. I wrestled the front wheels back onto the road surface. I thought I had recovered, but my right rear tire lost traction in the gravel, causing me to overcompensate. I careened across the road, striking a gully. The car rolled at least twice and spun around 180 degrees, landing on the passenger side. All I could think about after I rolled, was that I was still alive. I released my seatbelt while a passing driver stopped and helped me out of my car. The damage to my car

There may be some who read this article and remain unconvinced that seatbelts save lives. You still won't wear them. If you won't wear them for yourself, how about for your family? Remember, a car can be replaced, but you can't be traded for a new model. If you care about your life at all, remember what happened to Doc, and think about how I escaped an extremely serious accident with only a bruised shoulder. A miracle? Yes, quite possibly. But I also had the good sense to buckle up before I started my trip. Think about that the next time you get behind the wheel. ■

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PROCEDURES?

Don't Need Them, I'm An Aircraft Commander

Anonymous

It started out as a nice day. The office was quiet and work was slow. We had just completed our last open investigation; and I was thinking of playing a round of golf, when the phone rang. An excited command post controller rapidly told of a BUFF that had just landed and whose landing gear had collapsed. As I calmly responded to the flightline, trying not to break my neck or run over any innocent pedestrians, I wondered how long it would take us to scrape the mess off the runway. This was our lucky day; however, only one rear set had collapsed. With no evidence of major damage, maintenance cranked the gear back down, put the pins in, and towed the aircraft to parking.

No injuries, no major damage. This investigation was going to be easy. I had already made up my mind that maintenance had screwed up, when I learned, as they say -- the rest of the story.

The sortie was a routine training flight, completed without incident until returning to the pattern. Upon lowering the landing gear during their first approach, the crew noted an intermediate indication on the right aft main gear position indicator. However, the warning light in the landing gear lever extinguished after the other gear indicated down and locked. The aircrew elected to do a low approach and have the runway supervisory officer (RSO) visually check the gear's position. The crew descended to 200 feet AGL and overflew the RSO, who reported that the right aft main gear appeared to be extended and symmetric with the other gear. The RSO confirmed that command post (CP) had

copied the crew's problem. The pilots briefly discussed the problem amongst themselves and decided that their gear was, in fact, fully extended and that the landing gear position indicator was malfunctioning. They decided to fly one visual pattern to a full stop. On downwind, they cycled the gear in an attempt to correct the indication problem. Indications were identical when they lowered the gear the second time, but at no time did they consult their flight manual or declare an emergency. On landing rollout, the right aft main gear began to collapse, dragging the tires along the pavement. As the mishap aircraft taxied clear of the runway, the RSO and a transient alert maintenance crew simultaneously noticed the gear's condition and informed the crew. They stopped, shut down, and egressed. The only damage noted was minor scuffing (within limits) to the left tire on the right aft gear truck.

When maintenance technicians examined the right aft gear, they discovered two broken wires. One wire controlled the landing gear hydraulic pressure and the other one provided cockpit gear indications. The right aft gear extends forward into the wind; and without hydraulic pressure, it didn't have enough "umph" to activate the overcenter lock. The wire that provided cockpit gear indications prevented a signal from reaching the warning systems (gear handle light and warning horn). It also prevented signals from reaching the position indicator; so, as any smart indicator knows, if it doesn't get an up signal or a down signal, it automatically goes to its intermediate position.

The emergency extension system was up and

working, easily available, simple to operate, and it would have locked the gear down.

The B-52 Dash 11 (Dash 1 to us normal types) contains a very detailed checklist addressing gear failure to extend. Had the pilots followed their checklist, the gear would have been safely extended and locked. Had they declared an IFE, they would have been directed to accomplish the checklist. Both pilots were confused about what constituted "GEAR FAILURE TO EXTEND." The checklist contains no specific definition of "FAILURE TO EXTEND." The AC thought the checklist applicable only in cases where the gear continues to indicate "UP" when the lever is placed down. Had he taken time to read the checklist, however, he would have noted that it directs the pilot to verify that affected gear indicate "DOWN AND LOCKED" 12 separate times during various steps.

The base "AIRCRAFT EMERGENCY AND MARGINAL WEATHER PROCEDURE" regulation directs aircrews to immediately notify the CP any time they encounter malfunctions which could develop into an emergency, cause significant mission deviation, or which are among certain malfunctions listed in the back of the regulation. This list is designed to be used by the CP controllers, but crews are required to be familiar with its contents. It specifically lists "FAILURE OF GEAR TO EXTEND OR RETRACT" and "ANY UNSAFE GEAR INDICATION" as reasons to notify the CP. At no time did the crew or the RSO specifically tell the CP that the mishap aircraft had an unsafe gear indication. Had either done so, the CP would have begun a notification process that would have led to use of the "GEAR FAILURE TO EXTEND" checklist.

The pilots thought the right aft gear was down and locked, despite the intermediate position indication, because the warning light in the gear lever went out and the warning horn was not blowing. They understood that the light in the handle illuminates whenever the position of the lever disagrees with the position of the gear. They did press to test the lights, which operated normally. They did not understand that some malfunctions, such as the one

they encountered, remove power from the indicating system, thus giving an intermediate position indication and allowing the warning light in the gear lever to extinguish at the same time. The AC was "led" to believe the gear was, in fact, extended based on what the RSO told him during the crew's first approach. The AC had seen intermediate gear indications before, and each time they had been due solely to malfunctioning position indicators. This contributed to his complacency concerning the gear's position. The pilots' failure to consult their tech order and/or declare an inflight emergency (IFE) was a result of complacency.

The RSO was an aircraft commander, of a different type aircraft, on his first RSO tour. He had little familiarity with B-52 gear, but accurately reported that the gear appeared "down and symmetrical." It would be difficult for the best-trained observer to see more than this from the RSO position. The RSO had been having trouble hearing CP frequency throughout the day and had the impression that the mishap crew had informed the CP of their problem already. He felt that he had "come in on the middle of the conversation." Had the crew, in fact, already contacted the CP, he should have expected to hear some interplay between the crew and senior supervisors. He did verify that the CP had copied the mishap crew's initial call informing him of the "intermediate gear indication." He did not, however, ensure that CP controllers were aware that this implied an "unsafe gear indication"; words which would have required the controllers to begin notifying senior supervisors. He was fully aware of his duties under RSO regulations; however, the mishap pilots' complacency concerning the gear problem, coupled with confused radio communications, led the RSO to regard the situation as less serious than it was. The RSO's inexperience prevented him, as a supervisor, from being proactive in accomplishing his duty.

BOTTOM LINE: Supervisors must supervise, no matter how inexperienced they are. Pilots who think they know, without consulting T.O.'s or consulting those in the know on the ground, are mishaps waiting to happen. This time we were lucky. ■

Do the Right Thing



*Lt Col Woody Lamar
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I have been to Annual Field Training (Summer Camp) with my unit many times over my 20 years in the Air Guard and have learned to expect the unexpected. We do a pretty good job of protecting our people and resources on the job; it is the off-duty time that causes commanders and safety officers to become prematurely gray. We can only hope that the training and discipline we stress on the job carries over to the off-duty periods.

It was the first night at the training site. We had conducted a mobility exercise that morning at home station and deployed that afternoon. That evening five unit members, all in their early twenties, got into a midsize Chevy sedan and left the training site to get some items for the barracks. As they waited to turn left into a shopping center, an under-the-influence civilian driver in a full-size American auto struck them in the rear, launching them into the air. Their car came down left of the centerline on its "nose" and was struck by an oncoming van, also full size. The rear window came out; and as the car deformed under the impact, the rear seat occupants were thrust into the space where it had been, becoming passengers in a makeshift rumble seat. The front seat passengers were pinned in the wreckage and later cut free by rescue workers.

As I received the initial report I thought to myself: immediate supervisors, commanders, chaplains,

emergency notification data, next of kin. I ran through a casualty reporting checklist in my mind. Then I heard the rest of the report: they were all wearing seatbelts, there was no alcohol involved on the part of our people, and they were all going to be alright; in fact, four had already been released from the hospital.

What luck! Or was it? These men had made their own luck. The fact that they are alive is without question, luck; however, would they have been so lucky if they had not been wearing their seatbelts? We will never know for sure. The men in the rear seat probably would have been ejected through the rear window into the street and oncoming traffic. The front seat passengers had bruises diagonally across their chest corresponding to the shoulder harness. Just think of the energy that was dissipated before their bodies collided with the inside of the car; it had to have helped prevent or reduce the injuries. They were all lucky that they were wearing their seatbelts!

What caused these men to wear their seatbelts that night? Was it the result of a unit seatbelt campaign, some concerned sergeant who influenced them, or some comment that their commander had made? Their planned trip was not far, just a mile or so. Why did they bother to buckle up? . . . **IT WAS THE RIGHT THING TO DO!** ■

HEAR YE... HEAR YE!

There are mortal risks and consequences involved in defying gravity. The judges are stern. There are no light sentences or reprieves. You will either live or die.

There are three judges that sit on the **Aviation Court of Last Resort**: Mind, Senses, Hand. If you have an emergency and slowly or quickly enter the court, these judges will determine whether you live or die. One thumbs-down and you'll be sentenced to death. Those flying with you may also die.

The **Judge of Mind** will want to know if you understand the machine you fly and all its critical systems. Are you mentally prepared for failures in its interactive components? Did you posture yourself to stack the odds in your favor? Do you know and abide by the rules? Do you understand the environment and the aerodynamic characteristics of your machine? Do you plan, generate options, alternatives, next steps? Do you call on other minds for help and advice?

The **Judge of Senses** will evaluate your eyes and ears and fingertips. Do you see, hear or feel the changes that brought you to court. Do you sense crossing the sometimes narrow boundary between normal and abnormal? Are you perfectly attuned to the environment and machine?

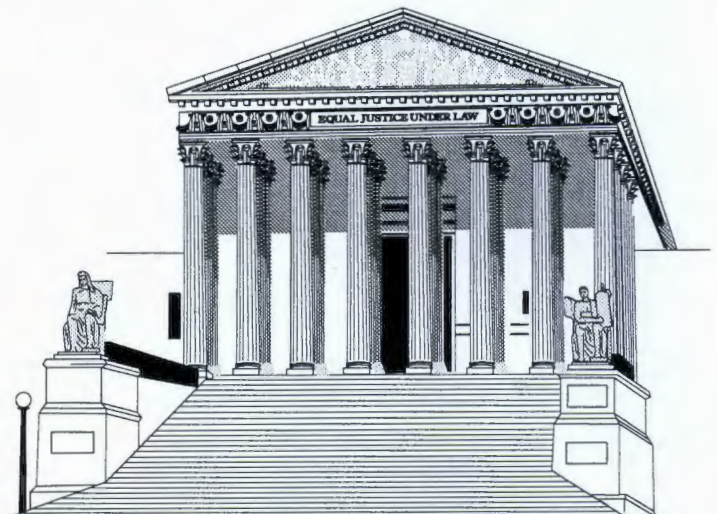
The **Judge of Hand** rules last and can overrule all the other judges. An agile mind and perfect senses are worth nothing if the hands fail at a critical

moment. Things can change rapidly -- in fractions of a second. Were the hands quick enough, experienced enough? Did they manipulate the controls, move the throttles, press the right buttons, or pull the handle when they should have?

Every time you prepare to fly, prepare to go to the Aviation Court of Last Resort. Know that you could enter it as soon as you enter the machine -- or even at base operations. There are mortal risks and consequences involved in defying gravity. The judges are stern. There are no light sentences or reprieves. You will either live or die. Choose to live so you can help the enemy die.

Even as you read this, somewhere in the world the judges are summoning someone. Be ready when the Sky Bailiff calls: "Hear ye... Hear ye... The next case is..." ■

*Colonel Szafranski
Commander, 7 BW
Carswell AFB TX*





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Fatigue Management

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Since 1974, tactical fighters have had 68 Class A night mishaps. Seventy-one percent of those were due to causes unique to the night environment. Twenty-five percent of the mishaps listed aircrew fatigue as a contributing factor. Other problems, such as spatial disorientation, task saturation, channelized attention and complacency, increase almost exponentially with increasing fatigue. Also prevalent is visual stimuli fixation, slowed reaction times, decision making difficulty and impaired hand-eye coordination. In essence, fatigue is potentially the most serious human factor problem associated with night flying. Fatigue, fatigue recognition, quality sleep and fatigue management techniques should be a priority concern for everyone involved with night flying operations.

Fatigue is a cumulative function of three subsets: acute, cumulative and circadian. Acute fatigue is the immediate, subjective feeling of tiredness following a demanding activity. The most common and easiest to recognize, this fatigue is felt after your annual 1.5 mile run. Recovery time is rapid given a short rest or recovery period. Cumulative

fatigue results from demanding activity over a period of time and is associated with inadequate rest. This fatigue is best typified by a week of "two go" days where your energy reserves are gradually drawn down. Recovery time required varies from one good night's sleep up to 3 days depending on

the severity of the fatigue. Note that cumulative fatigue is associated with "inadequate rest" not lack of rest. Sleep quality vs quantity is all important. Circadian fatigue occurs when a shift in sleep/wake cycles is experienced. Circadian rhythm is a function of the body's "internal

clock" which has a cycle of 21-30 hours depending on the individual. These rhythms control the body temperature which, in turn, influences pulse, blood pressure, breathing rate and, most importantly, brain efficiency. Body temperature attempts to regulate bodily functions so the body will be most active during the day and least active at night. Normal "day" rhythm produces a peak in performance between 1200L - 2100L and a nadir between 0300L - 0600L. Performance degradation occurs during this nadir despite having "adequate" sleep. Readjustment of circadian rhythm is subject to many

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variables, but generally can be shifted approximately 1 to 1.5 hours per 24-hour period. A shift from a day flying schedule to one with landings between 2300L and 2400L will take 1 to 2 days. A full shift into a night schedule should be expected to take at least 5 to 6 days, but complete acclimation may not occur for 2 weeks.

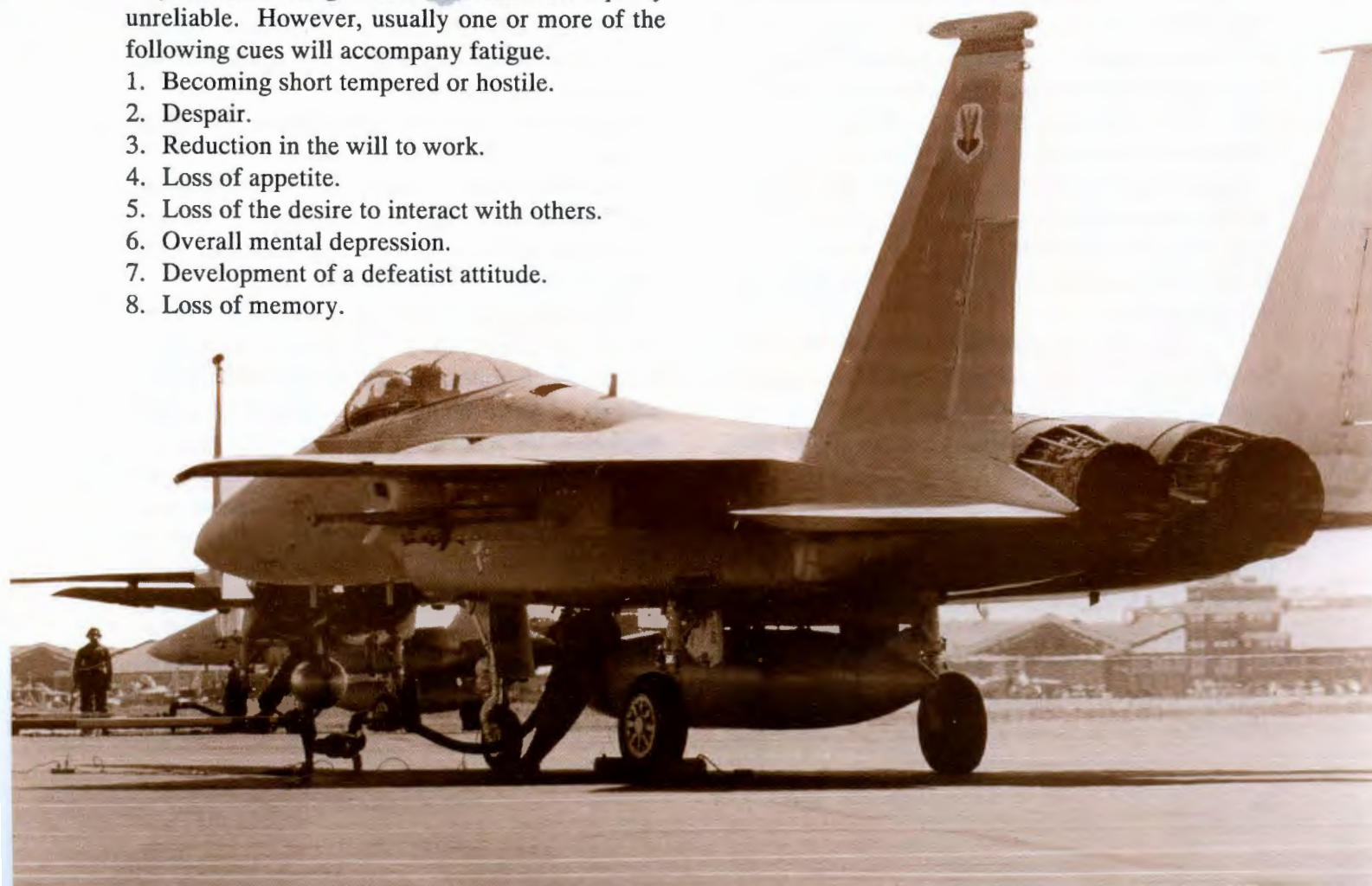
The fatigue of night flying does not debilitate everyone equally. Age, emotional maturity/stability, diet, physical condition, family life, social environment and personal habits all influence a flyer's susceptibility to fatigue. Because fatigue traits/behavior are personalized, it is difficult for managers to "see" fatigue. Although these may be symptoms of fatigue, just looking or acting tired may be misleading. Emotional cues are equally unreliable. However, usually one or more of the following cues will accompany fatigue.

1. Becoming short tempered or hostile.
2. Despair.
3. Reduction in the will to work.
4. Loss of appetite.
5. Loss of the desire to interact with others.
6. Overall mental depression.
7. Development of a defeatist attitude.
8. Loss of memory.

Fatigue can also be recognized by flying performance degradations similar to the following:

1. Aircrews increasingly willing to accept lower standards of accuracy and performance.
2. Pilots over control the aircraft with a tendency to be rough on flight controls.
3. Aircrews project their mistakes to the aircraft.
4. Aircrews become more aware of the physical discomforts of the flying equipment and working environment.
5. Aircrew inattention to instrument procedures.
6. Aircrews missing radio transmissions and responding incorrectly on the radio.

As mentioned earlier, symptoms of fatigue are personalized and each individual will react differ-



ently to sleep deprivations. It is critical that once the onset of these cues are recognized, the individual or manager take immediate action to seek a remedy.

The one and only cure for fatigue is sleep. It is not only the length of sleep that is important, but also its quality. Quality sleep embodies three elements: Rapid Eye Movement or REM sleep, Delta Wave sleep or deep sleep and the overall length of sleep. REM sleep, a more shallow sleep, usually happens in the last 1/3 of the sleep cycle. Deep sleep most often occurs in the first 1/3 of the sleep cycle. Both types of sleep are needed and act to repair or rejuvenate different body functions. REM sleep is required to maintain a healthy mental balance and the ability to deal with stress, while deep sleep is required to maintain physical stamina. Alcohol, amphetamines, caffeine, nicotine and other self-induced drugs significantly reduce both REM and deep sleep. Quality sleep is also impaired by light. A sensory apparatus within the eye dispatches neural impulses when stimulated by light. This is known as discharges of the retina and is a biological alarm to bring the sleeping person to a higher state of consciousness. In short, light wakes you up every bit as efficiently as your alarm going off, a telephone ringing or your baby crying. These all disturb the depth and length of sleep and, thus, its quality.

The following are recommended guidelines for crews who will be or potentially could be tasked to night fly. These guidelines are addressed in 3 time periods, after nautical twilight, after 2400L and after 0230L.

Landing times after nautical twilight:

1. The duty day during night operations is limited to 10 hours maximum for single-seat aircraft. A recent F-16 mishap resulted in the direction that all single-seat fighter operations comply with this restriction. A review of fatigue-related Class A mishaps since 1976 indicates no statistically sig-

nificant difference between 1- or 2-seat aircraft. This guideline is designed to defend against the effects of cumulative fatigue.

2. To allow for circadian adaption, a crewmember's first night mission of the week should end NLT 2230L.

3. Crewmembers should fly no more than 3 consecutive nights. This defends against an excessive cumulative fatigue buildup.

Flight operations past 2400L should follow the above guidelines plus this additional guideline: 2 days of circadian rhythm adjustment is required

before landings after 2400L (i.e., first night mission ends prior to 2230L and second night mission ends prior to 2400L). Additional guidance for landings beyond 0230:

1. Complete circadian rhythm adjustment.
2. Crews are provided appropriate sleeping quarters which include individual climate control, blacked out windows, sound proofing and isolation from day-time workers.

Additionally the following policies are recommended:

1. Any crewmember must be allowed and encouraged to ops cancel sorties due to fatigue. Supervisors should stress this at crew meetings and other appropriate forums.
2. Establish appropriate currency requirements. As currency drops, the potential for task saturation and spatial disorientation increases, especially with fatigue. After a long layoff, night flying should emphasize the walk-before-you-run concept.
3. Educate crews, support services and families on the principles of fatigue management, stress management, circadian rhythm and identification and treatment of fatigue. They must understand why the crewmember must stay on a night schedule once established and why sleep must not be disturbed.
4. When in a night flying operation, the weekends should be treated as required R&R void of any

The one and only cure for fatigue is sleep. It is not only the length of sleep that is important, but also its quality.

official duty requirement.

5. After a long layoff from night flying, a night phase brief should be given.

The following are recommended techniques for crewmembers to prepare and stay conditioned for night flying:

1. Restrict late night coffee intake to prevent the caffeine from interfering with sleep.

2. Limit alcohol intake to prevent interference with REM and Delta Wave sleep.

3. Abstain from all tobacco products because of adverse effect on night vision and carbon monoxide poisoning.

4. Stay in good physical condition. A sedentary body tires easily while a physically fit body can better tolerate the stresses associated with night operations.

5. To help adjust your body clock, attempt to stay awake later each night and allow yourself to sleep

later in the morning.

6. To help adjust your circadian rhythm, try to slip your meals to align them with the duty day.

7. Eat high protein/natural sugar snacks (i.e., apples, etc.) between meals and before flights to boost your energy.

8. Avoid sleep interruptions. Make your bedroom as dark as possible by drawing all the blinds and placing dark covers over the windows. Remove the phone from the room or turn off the bell. Recruit the support of your family and encourage them not to disturb you while you're sleeping.

Successful fatigue management is dependent on a sound program to control fatigue and the ability of aircrews and supervisors to recognize fatigue before it becomes a critical factor. ■

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KEEPING YOUR HEAD ON STRAIGHT

"Am I eligible for VSI or SSB?"

"Is a RIF coming?"

"How long will I have a job in missiles?"

"With the Cold War over, why do we still have to man all the LCCs?"

"If there is a RIF, what can I do to make my OPR read like I'm a god?"

"Did that maintenance team say their vehicle went off the road and they lost their P-plug?"

"What is TQM... and what is ACC Quality?"

"If I'm eligible for a RIF, am I required to buy one of the new uniforms?"

Does this sound like your alert? These days it probably does, with one glaring exception. Did that maintenance team drive off the road, and did they say their P-plug was lost? If so, how would you explain to your wing commander that you failed to follow emergency contingency procedures, or that you missed the possible code compromise situation? Of course, it would certainly answer those other questions about your future!

This article is not about how to do your job, but rather a reminder to "keep your head on straight."

Right now the Air Force is experiencing change at a rate not seen since its inception in 1947. ICBMs and alert aircraft are standing down. Budgets and weapon systems are undergoing cuts, and major reorganizations are still underway. Changes in procedures arrive almost daily. Even the uniform is under revision! And naturally, the most pressing issue is the reduction in personnel strength that must take place. But one thing that hasn't changed is the fact that we still exert positive command and control over the most powerful weapons known to man.

When we're on alert, we can't afford to have anything — even the fear of a RIF — overshadow the magnitude of the job. We're still in the business of operating, maintaining and securing nuclear weapons. On alert or not, there are still re-entry vehicles in silos which demand our full attention. The

American people have entrusted us with safeguarding nuclear weapons, and we must uphold that trust.

Certainly, there is a potential for some people to look upon missile crew duty as "baby sitting," especially since the historic stand down of Minuteman II systems on 28 September 1991. Because we've operated Minuteman for so long (30 years this October) without a nuclear mishap, it's easy to become complacent and believe that nothing serious will happen. On the other hand, some people may spend so much time concerned about "career dissipation" that they become overly cautious. These are two extremes which we cannot tolerate during a time of change. They lead to mistakes.

As we stand down ICBMs and remove them from silos, the eyes of the world are upon us. It's imperative we retain the same calm, quiet confidence which has characterized missileers since the early days.

Many changes have occurred in

the way we do business since the stand down. We no longer have to insert daily remote weather; security responses vary according to the status of the missile affected; and buffer 10 Security Control Network tests are no longer required during monthly Olympic Play exercises. Those Minuteman III and Peacekeeper crews who did not stand down wait anxiously each day for the next possible round of reductions. But there is no need to "wing it." The old adage still applies, "99 percent of the time your checklists will save you." The Special Interest Items from DOT and your fellow crewmembers make up the other 1 percent.

Missile crews are still concerned with 4 areas: positive control, nuclear surety, security and safety.

POSITIVE CONTROL

The concept of positive control is simple enough — the assurance that a sortie will launch only if directed to do so by the President. Though it sometimes may appear pointless to run certain post-maintenance checks and tests to sorties that are safed, they do continue to have a vital purpose. Enable tests, missile tests and calibrations provide the guarantee of a working, effective sortie, giving the Chairman of the Joint Chiefs of Staff and the President an accurate assessment of our strategic capability. It's still a critically

important mission!

NUCLEAR SURETY

Preventing the inadvertent or unauthorized deliberate arming, launching, or releasing of nuclear

Even in times of change, security is still one of our chief concerns. As weapons movements increase, there is an even greater opportunity for serious security situations to take place. Something as simple as a blown tire can end up in the national news and even lead to panic.

weapons is the function of nuclear surety. It also affords protection against mishaps creating a nuclear yield. The role of the missile crew in nuclear surety is threefold: adherence to tech data such as the Inhibit/Anti-Jam checklist, proficiency in code handling and, most importantly, the exercise of direct command and control over the entire flight area. Keep your head on straight here too.

SECURITY

Even in times of change, security is still one of our chief concerns. As weapons movements increase, there is an even greater opportunity for serious security situations to take place. Something as simple as a blown tire can end up in the national news and even lead to panic. Knowledge of the Minuteman security standards is crucial, but you must couple that knowledge with accurate status monitoring. Continue to commu-

nicate with your Flight Security Controller.

SAFETY

Safety is of prime concern. The Missile Crew of the Month Award recognized crewmembers who kept their heads on straight to prevent dangerous situations from developing or escalating. Even the Secretary of Defense made note of the importance of safety in his message directing the

Minuteman II stand down. During times of change, stress levels increase. When stress levels increase, lapses in attention can occur. When attention to safety slips, mishaps happen. Missile operations have an excellent safety record. The best thing that missile crewmembers can do to maintain that record is learn to recognize signs of stress and develop ways to deal with it.

As missile crews, we're among the most proficient officers in the Air Force — the responsibility we have demands it. In light of the tremendous changes taking place in the military and the world, it's important to remember that what we do still requires immense diligence. The responsibility and commitment has not been diminished, and we absolutely must keep our heads on straight! ■

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CAN'T DO



“Can’t Do!!” is **NOT** a **PROACTIVE** attitude, especially when dealing with safety issues and deficiencies. When a safety deficiency is discovered, there is usually something that can be done to correct or minimize the hazard. But it seems that many times, the office of primary responsibility (OPR) for the area identified responds initially with “Can’t do anything because...”. “Can’t Do...” is the greatest enemy to hazard abatement and mishap prevention.

This article centers on the one “Can’t Do” argument which proves the hardest for safety to overcome: The Military Unique Workarea, ref: AFR 127-12, para 14c(1). This exception states:

Military-Unique Situations. OSHA standards do not apply to Military-Unique workplaces, operations, equipment, and systems. However, insofar as is possible, practicable, and consistent with military requirements, they must be applied. AFOSH standards apply to these situations unless specifically exempted by variance.

When the Military Unique argument is used, only the first sentence is quoted by the office making the argument. Safety personnel must, however, investigate to determine if the exception is applicable.

For example: If a moving part is required to be guarded by OSHA standards, but guarding the moving part would negate the military use of the item, the application of the standard would not be required. If guarding the moving part would **NOT** affect the military use of the item, then the OSHA standard would apply.

The Military Unique designation covers a wide range of Air Force property and workplaces. ICBM missile sites and launch control facilities are among these areas. The general stamp of “Military Unique” is often used to defer correction of safety hazards. With the increase of civilian workers in the ICBM workforce, it is increasingly important to examine each hazard to determine if the designation applies. The safety office must take the lead to ensure that each deferred hazard meets the standard set by AFR 127-12.

At ICBM launch control equipment buildings (LCEB), there are large intake and exhaust fans. These fans have rotating shafts with protruding setscrews and do not have guards as required by OSHA standard 1910.219(h)(1). The safety deficiency was assigned a risk assessment code of 4(IIId), and a workorder was processed to install guards on the fans. Since the illustrated parts breakdown of the fans does not show a guard, the

situation was treated as though the guarding was never there. The subsequent investigation determined that these fans were guarded at one time, but the guards were removed for an unknown reason. The response to the hazard from the OPR was that the LCEB is Military Unique and OSHA standards do not apply. There is no question that the LCEB is Military Unique per AFR 127-12. The situation of the rotating shaft must be examined in light of the second sentence of that paragraph: "However, insofar as is possible, practicable, and consistent with military requirements, they must be applied." Since the guarding of the shafts will not reduce the performance of the equipment and making the shafts safer is possible and practical, the shafts must be brought into compliance with the OSHA standard.

At yet another ICBM launch facility, a worker reported a hazard concerning a hole which had

developed between the soft support building (SSB) and the launch facility (LF) parapet wall. The previous night, he stepped in this hole and twisted his knee. He stated that the lighting system on site did not allow him to see the hole at night. After investigating, it was

determined that a hazard did exist. A worker survey found that one out of four workers had stepped in the hole at one time or other. Most knew the hole

was there; but at night, they misjudged their steps. The OPR stated that the launch facility was Military Unique and correction of the hazard was not required. The OPR's initial rejection of this hazard was not a proactive safety response. Since the hole is not required for the facility to meet its mission and the repair cost is small when compared to just one individual's injury and possible long-term disability, the repair must be accomplished to comply with OSHA standards. The planned final fix to this hazard is to box the hole with a thin metal plate and fill the hole with rock. The estimated time required for the fix is approximately one-half hour per site.

AFR 127-12 provides for the Military Unique designation because some of our workareas and operations are hazardous by design. It does **NOT** preclude all safety hazard abatement when the abatement can be completed without decreasing the effectiveness of our weapon systems. A proactive response to safety requires us to examine each specific hazard and weigh its correction against the military mission. Blind acceptance of the exemption could leave workers exposed to easily corrected safety discrepancies, draining monies and efficiency from our limited resources to treat injuries.

Remember: Preventing injuries requires all individuals, supervisors, and agencies to work together. Do not dismiss hazards in Military Unique areas lightly! Investigate each specific hazard thoroughly and determine if engineering or education is the best solution. Be proactive and help replace the "Can't Do!!" with a "Can Do!!!". ■

MSgt Edwin H. Mobley, Jr.
90MW/SEW
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ACC SAFETY AWARDS

One of the five Air Combat Command goals for 1992 is improving safety performance by fostering a culture of safety in the air and on the ground. Mishap prevention through the recognition of quality performance is one of Safety's main thrusts. The Air Combat Command Safety Awards program is a vital core function of our mishap prevention program. Therefore, the Air Combat Command Safety Awards Program establishes a comprehensive hierarchy of awards covering all safety disciplines. An overall view of the program follows:

ANNUAL AWARDS

Commander's Award for Safety

Flight Safety Award

Safety Sustained Superior Performance Award

Safety Office of the Year Award (Category I & II)

Distinguished Chief of Safety Award

Distinguished Pilot Safety Award

Distinguished Aircrew Safety Award

Distinguished Flight Safety Officer Award

Distinguished Flight Safety NCO Award

Distinguished Crew Chief of the Year Award

Distinguished Flightline Safety Achievement Award

Distinguished Ground Safety Leadership Award

Exceptional Ground Safety Leadership Award

Superior Performer in Ground Safety Award

CMSgt Paul A. Palombo Award for Distinguished Ground Safety Newcomer Award

Annual Unit Ground Safety Award (Category I & II)

Annual Traffic Safety Award (Category I & II)

Exceptional Weapons Safety Officer Award

Exceptional Weapons Safety NCO Award

Distinguished Weapons Safety Achievement Award

Outstanding Unit Weapons Safety Award (Category I & II)

MONTHLY AWARDS

Pilot Safety Award of Distintion
Aircrew Safety Award of Distinction
Crew Chief Excellence Award
Flightline Safety Award of Distinction
Unit Safety Award of Distinction
Ground Safety Individual Award of Distinction
Weapons Safety Award of Distinction

QUARTERLY AWARDS

Flight Safety Award of the Quarter
Ground Safety Award of the Quarter
Weapons Safety Award of the Quarter

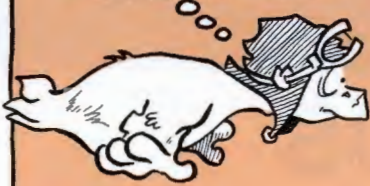
RECOGNITION

Safety Team Salute

Interim guidance has been provided to Numbered Air Forces and Direct Reporting Units in the form of ACC Draft Sup 1 to AFR 900-26 This guidance is effective 1 October 1992 and can be used until formal publication of ACC Sup 1. Nominations should be prepared as indicated in the draft supplement and submitted to HQ ACC/SEP by an in-turn letter signed by the unit commander. ACC monthly awards are due by the 1st of each month. ACC quarterly awards are due by the 1st of January, April, July, and October. ACC annual awards are due by 15 December. USAF annual awards are due 1 November. POC is Janet Gaines, DSN 574-3658.

Fleagle

LOOKS LIKE I'M
GONNA GIT HOME LATER
THEN I PLANNED.



BUT NOT TO WORRY.
I'VE HAD MANY HOURS
OF FLYING IN TH'DARK.



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AND A FEW LAYERS
OF CLOUDS DON'T
THROW ME OFF
ONE BIT.



WOW! IT SURE
GOT DARK IN
A HURRY.

I... I FEEL SO ENGULFED.
BUT MY YEARS OF
EXPERIENCE TELLS ME
I'M STILL ON TH'RIGHT
TRACK AND TH'RUNWAY
IS DEAD AHEAD.

LIGHTS!! I SEE
LIGHTS!
TAKES MORE THAN A
LITTLE BIT OF NIGHT
AN' A FEW CLOUDS TO
THROW THIS OLD BOY
OFF BEAM.

CRASH!



ONCE UPON A TIME

*Maj John Marshall
HQ ACC/SEF
Langley AFB VA*

The following "story" is just that - - a story, and not an actual occurrence being recounted. But, it could happen tomorrow. All the ingredients and distractions contained in it are real, and most of us who have read a mishap report can relate to the "sequence of events" or the cumulative effect of numerous inputs that degrade performance or attention. The aim of this "story" is to remind us all that we are in a period of tremendous change and turmoil. Focus, self-discipline, supervision and leadership are more essential now than ever before.

We begin our story at a LANTIRN F-16 wing where the subject of our story, a young but experienced Viper pilot, is beginning his day. And what an eventful day it will be...

Captain Joe Jones awoke about 0830. He wanted to sleep later since the takeoff time for his evening LANTIRN mission wasn't until 2000, but he had been on a "day" schedule for awhile now. Besides, he had gone to bed at 2330 the night before, so that should be adequate rest, shouldn't it? Maybe he could grab a nap before he reported in to the squadron at 1400...

Capt Jones had a breakfast of cereal with skim milk and a glass of Crystal Light - his cholesterol had been high on his last physical. Joe planned to run a few miles before going in to work in the afternoon since the aerobics test was next month.

After breakfast, Joe made a short list of the things he needed to do in the next couple days: call MPC Assignments, visit CBPO for a records check and some financial matters and a dental check-up. Oh yeah, he also had to contact his buddy over in the

"sandbox" who was having trouble reaching Assignments. It seemed he was having trouble accessing the bulletin boards; and when he did get on to inquire about a job, it was already taken.

The Dental Clinic had no appointment slots available after 1100; and they closed up shop at 1630, so that would have to come first. He figured he would run after his dental appointment, clean up and go to CBPO before he ate lunch at 1300 or 1330. He packed his dinner to take to the squadron (turkey sandwich with no mayo, lowfat yogurt, diet Coke, an apple, and, oh what the heck, a Hershey bar - after all, he WAS a fighter pilot!) and left it in the refrigerator for now. After paying a few bills and cleaning up around the house, it was time to head out for the Dental Clinic.

After an uneventful visit to the dentist, Joe changed and hit the track. It was getting a bit hot outside, but he had committed himself to getting more aerobic exercise, and he was well hydrated. After showering, he was off to CBPO.

His CBPO visit took longer than he planned, since

the workers he needed to see were out at lunch when he first arrived. Once they returned, there was confusion over a recent program and policy change. However, a call to higher headquarters resolved the confusion. As a result, Joe didn't have time to return home and eat a good lunch or pick up his brownbag dinner; so he grabbed two BK broilers on his way through the Burger King on base, one for now and one for dinner (thank goodness for the squadron microwave).

After arriving at the squadron, Joe made a call to another ACC base to coordinate an upcoming exercise with the project officer. He got the distinct feeling that the guys were having a heck of a time since their base was closing soon, and a bunch of them were in the same assignment pool as he. After he hung up, he got to wondering again about his own job and flying prospects on his pending PCS. Joe walked around the squadron looking for more experienced guys to just talk to about things; but aside from the commander and ops officer, there weren't many guys left in the wing with more than a couple tours in the aircraft or 12 years or so in service. The top two, he felt, were probably too busy to just sit and talk to him about a lot of things on his mind.

Once the afternoon flying began, he noticed a few more MNDS, ground aborts and Codes 2 and 3 than usual. His ops officer had briefed the squadron on the effects the separation incentives and RIFs would possibly have on a few maintenance areas, and it was more important than ever to help the maintainers with good write-ups as well as doing especially thorough preflights.

Capt Jones talked with his flight lead well before brief time to check on the scenario and help with prebrief planning. With the world situation changing so much, it was hard to tell which part of his wing's world area to look at and devise scenarios around. But his squadron was ginning up toward a night Turkey Shoot, and Joe felt he was in contention to be on the team.

The flight briefing was thorough and professional; and after his element coordination brief, Joe had time to eat his "dinner" accompanied by another diet Coke. He stepped to his jet; and after a delay for a hydraulics Red Ball and a range extension, they took off.

En route ops checks of the

LANTIRN and TFR systems were uneventful, but he wished he could fly more often in the aircraft or practice in a full-up sim since this was a busy mission. Budget cutbacks had reduced most guys' flying hours and also prevented the simulator from reaching full capability in terms of IR visual cues or software currency.

They were cleared on range for their planned loft deliveries, and Joe checked his parameters and switchology as he sequenced himself behind Lead. Shortly after calling "In," he heard the RCO pass Lead his score - "Shack, one." "Roger." Joe pressed in, met his parameters, devoted his attention to his recovery and heard his score over the radio - "Eighteen at four, Two." What had gone wrong? Well, he'd check his targeting pod for impact himself after completing his recovery on the next pass, he thought. Lead's next bomb

was just as good; and after Capt Jones had pickled and completed his recovery, he looked at the pod video to check his impact. Just a few more seconds ... there it is, a good bomb....

The mishap investigation board determined that Capt Joe Jones had no system malfunctions, but had misprioritized his attention and tasks. He was inattentive to his position in relation to Lead's for too long and had cut him off on his turn to downwind. They had a

mid-air at the aptly nicknamed Coffin Corner—Lead was damaged, but recovered. Capt Joe Jones was a fatality. During the board proceedings, such factors as diet, crew day, circadian rhythm and adherence to regs and guidance came up. But probably the hardest areas to quantify were areas many of us are facing each day, just like this "Mishap Pilot."

Assignment insecurity, job or financial insecurity, base closures, thinly manned disciplines in many Ops and Support functions, long, late days or nights in a task-intensive environment, a paucity of

intermediate-level expertise, leadership and supervision in our wings - all these point to the importance of superior self-discipline, task prioritization and attention (and intervention, if necessary) from supervisors.

It's difficult to "stop what we're doing" when we may feel we're "doing too little" of it in the first place. But if it doesn't feel right, or if WE don't feel right or aren't focused and fully aware of the task and procedures at hand, we'd better call a King's X. Teamwork, good leadership, self-awareness and self-discipline are essential to carry us safely through this fast-changing time. Fly Safe - and Fly Smart. ■

