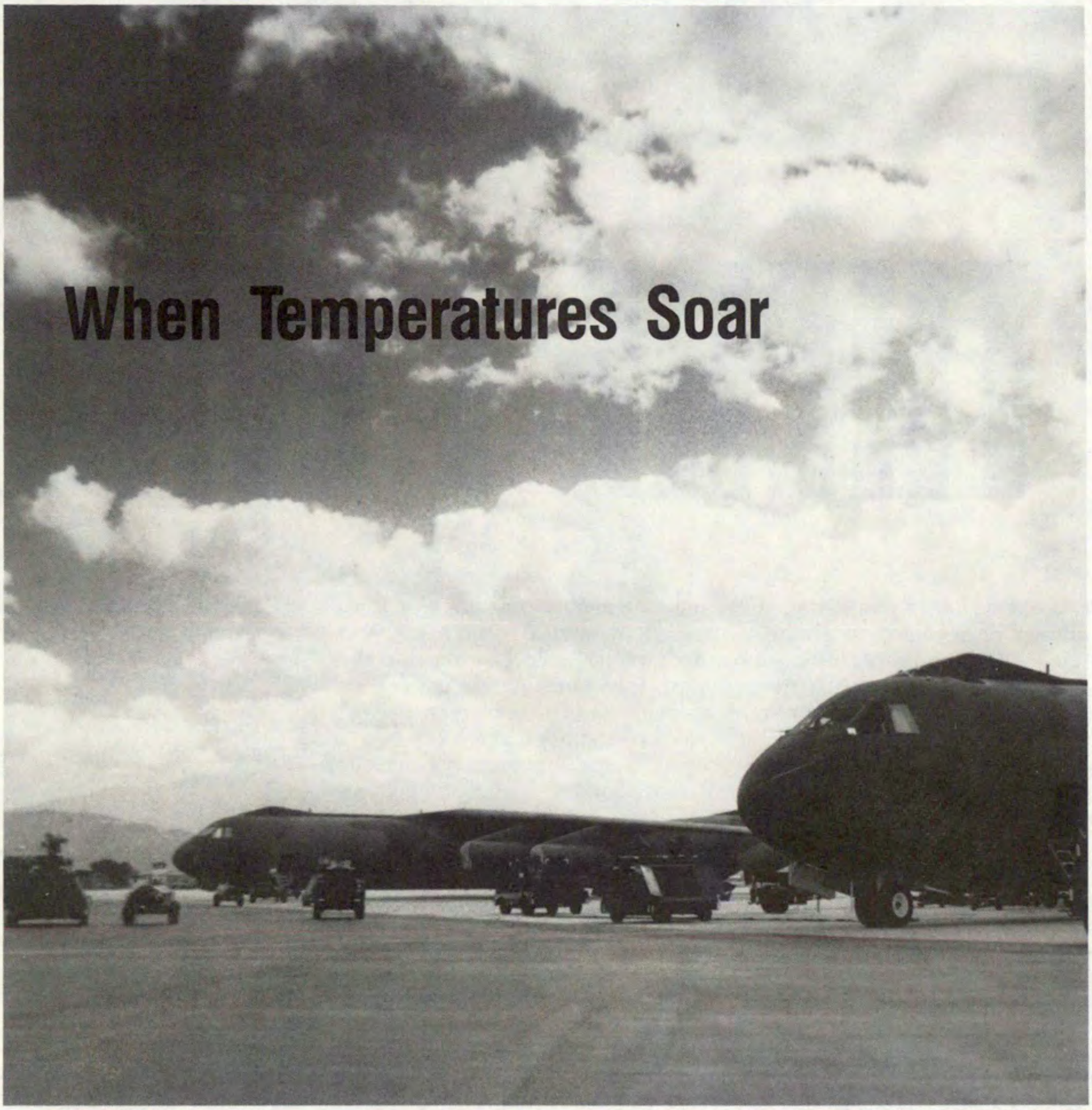
flying SAFETY

JULY 1988



USAF PHOTO BY RON SAMUELS 1352 TSG

THERE I WAS

■ I, like all other pilots, had the attitude that "it could never happen to me." Although I constantly went over my boldface emergency procedures and ejection criteria, I never considered even the possibility of the situation I found myself in during January 1987. I was doing 40-degree, 500-knot visual dives at a target in the Imperial Valley. I had flown an identical hop that morning with the same IP and aircraft. It was basically a repeat of what we had just flown, so we were both set to go out and concentrate on a good CEP.

All evolutions up to the target were uneventful; we were in a 40-degree dive looking for 500 knots at release. I don't think I'm all that different by saying that when doing high-angle dives, my attention is focused on altitude, airspeed, and dive angle while I'm tracking the pipper and making mental release calculations. The point is that I can't think of another maneuver where a catastrophic emergency could be less welcomed or where a pilot's attention is so focused on the mission at hand.

What happened next neither the IP nor I could have been ready for. Passing 8,000 feet, the left wing separated at the fuselage, followed by an instantaneous explosion as the wing fuel entered the engines. The aircraft went into a violent right, high lateral G roll and proceeded towards the ground as a fireball. There was no warning, and all that I remember is the aircraft starting to wrap up to the right as I lost consciousness.

The violent roll broke my left forearm six times and drove my helmet into the left side of the canopy, giving me a concussion, before I was able to react. Somehow, using survival instinct and a lot of luck, I was able to pull the upper ejection handle. My IP was unable to escape due to the extreme cockpit environment.

It's something you have to consider. Even now I have to fight the, "Well, it can't happen to me twice" attitude. We have all seen those ejection decision films, and marveled at the indecision and resulting fireball, but think about it! It happens! ■

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, OSAF

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When Temperatures Soar

PEGGY E. HODGE
Assistant Editor

■ As we are well into hot summer days when temperatures soar, it is important to look at what the heat can do to us. Let's review the recurring problems we face on a hot flightline and some guidelines to get us safely through the hot days of summer.

Aircrew Problems

The past 2 years of heat stress mishaps indicate dehydration and exhaustion as our problem areas. Let's take a close look at these two concerns.

Dehydration and Performance A significant danger of dehydration to crewmembers is its possible effect on performance.

▪ A student pilot's (SP) first flight of the day had been a solo ride in a T-37. He had stayed in the pattern for almost an hour on a very hot day and had been perspiring a great deal. He only had 1½ hours on the ground before his second flight.

The SP's second flight of the day was a dual contact ride. The SP and instructor pilot (IP) performed a series of touch-and-go's followed by area work.

About 45 minutes into this second flight, the SP attempted his third split-s maneuver. Halfway through the pull at approximately three Gs, the SP lost consciousness for about 5 seconds. The IP recovered the aircraft and returned uneventfully to base.

The flightline environment makes us prime targets for thermal stress. The parking ramp is hot, the cockpit hotter — and with flight equipment, it is even hotter still.

The SP was slightly fatigued and dehydrated from thermal stress experienced during his first solo pattern flight, resulting in a lowered G tolerance.

The following mishap again stresses the impact dehydration may have on our performance and points out the importance of acclimatization.

▪ During an afternoon range sortie at a deployed location, the WSO in an F-111 became actively airsick on the second sortie of the day. Both sorties involved multiple 10-degree and 15-degree weapons deliveries. When the WSO got sick, the crew returned to base.

The WSO, having just come from home station, was not acclimated to the heat at the deployed location. He did not drink enough fluids to prevent dehydration. The aggressive maneuvering required in the bombing pattern coupled with dehydration made him airsick.

About Dehydration As dehydration is a common occurrence this

Man is the only animal who does not drink fluids at the same rate as they are lost. We rely on our thirst mechanism which is unreliable as an indicator of need.

time of year, we must understand what it is.

The body is approximately 80 percent water. The average adult loses about 3 quarts of water a day through normal activity. You must at least replace this lost water or suffer the effects of dehydration.

The early signs of dehydration are darkening of urine, dizziness, and headaches. As it progresses, the victim may become dizzy, develop a headache, have difficulty breathing and, finally, lose muscular function. Unless water is soon made available, a person experiencing such dehydration may die.

As we have seen demonstrated in the preceding mishaps, dehydration can adversely affect our performance. Many of us operate at reduced efficiency even before being put in a high heat situation. That's because we depend on our sense of thirst to tell us when we need water. The problem is, we don't feel thirsty until we're about a quart low. Then we drink, but usually only replace about one-half to two-thirds of the water lost.

If we are not at our peak efficiency when we encounter a heat problem, we will become dehydrated even sooner than expected. As dehydration progresses, the body temperature increases because there isn't enough sweat available for proper cooling. As the body temperature rises and the water level falls, the results of decreased efficiency begin to show.

Heat Exhaustion and Performance The second problem we need to look at is heat exhaustion. Even mild effects of heat exhaustion can contribute to inattention and improper procedures, increasing your risk of mishap and injury. This commonly hits maintenance people working in the airless, enclosed aircraft environment. And, as we see in the following mishap, passengers just sitting in an aircraft are another target. In both cases, the lack of circulating air hinders evaporation and makes sweating ineffective.

- A C-5 crewmember was deadheading in the troop compartment. The outside air temperature was 91 degrees Fahrenheit, and he and the rest of the crew had spent 15 minutes loading their baggage. They were then seated in the troop compartment due to a lack of space on the flight deck. They were seated for approximately 20 minutes before engine start.

Temperature in the troop compartment was significantly hotter than the outside air temperature. After engine start, the affected crewmember complained of shortness of breath, faintness, and rapid pulse and then blacked out. The engines were shut down and medical help was requested.

The crewmember was diagnosed as suffering from heat stress, dehydration, and hyperventilation. The problems were apparently brought on by the physical exertion of loading the baggage and the high temperature in the aircraft's troop compartment.

In the following mishap, overexertion in the heat and a lack of fluid led to heat exhaustion.

- The flight was a day VFR tactical RTU mission to a drop zone. The loadmaster loaded and rigged the aircraft with heavy equipment training pallets.

After the first route and during the recovery, the crew shut down the No. 2 engine for a secondary fuel pump light and landed the aircraft. The loadmaster offloaded the heavy equipment pallets and then

continued

Physical exertion in high temperatures predisposes us further to dehydration, exhaustion, and other thermal stress problems. Even mild effects can contribute to inattention and improper procedures, increasing the risk of mishap and injury.

When Temperatures Soar continued

immediately uploaded them onto another aircraft. The offload and upload were accomplished in approximately 45 minutes.

The aircraft proceeded to the IP and rejoined the formation inbound to the drop zone. The aircrew elected not to drop due to inadequate time to accomplish the required checklists. The formation landed, remarshaled, and departed.

The route was 42 minutes. Approximately 35 minutes after takeoff on the third flight, the loadmaster put on his helmet and restraining harness. Just prior to the aircraft's slow down point, the loadmaster said over the interphone "I feel dizzy and . . . " the transmission stopped.

The loadmaster was discovered overcome by heat exhaustion. He was having muscle spasms and was incapacitated by the pain of the muscle spasms.

The loadmaster had consumed very little, if any, fluid after reporting for duty. His body lost more fluid than it took in, and he experienced heat exhaustion.

About Heat Exhaustion As heat exhaustion may also impact our performance, let's take a look at its causes.

Heat exhaustion may be due to water depletion or salt depletion. Heat exhaustion from water depletion is due to a failure to replace the amount of water which has been lost through prolonged sweating. It can cause thirst, fatigue, dizziness, and scanty urine output and is usually associated with a shortage of drinking water. Prevention depends upon a sufficient water supply.

Heat exhaustion can also be due to salt depletion and if so, is caused by an inadequate replacement of salt lost through sweating and causes fatigue, nausea, dizziness, and cramps. It is usually the result of hard work in high temperatures during which the individual drinks plenty of water but fails to replace his or her salt loss. A general weakness, giddiness, and muscle cramps are particularly common in this condition and represent the differences between this type of heat exhaustion and that due to water depletion. To prevent this form of heat exhaustion, ensure you have an adequate intake of salt as well as fluid. The typical American gets more than enough salt in normal meals, so salt depletion is not usually a problem.

Problem Prevention

Now that we've pointed out some problems with summertime heat, hopefully the following will help you safely through the hot days ahead.

- Drink more liquids — preferably water rather than sugar-laden fluids — than thirst requires. When you feel thirsty, your body is already about a quart low.
- Make a habit of drinking water on a scheduled basis that begins by up to an hour before heat exposure. Avoid coffee and alcohol as they tend to dehydrate you.
- Acclimatize. Realize that this takes time — usually less than 10 to 14 days. Follow a work schedule that allows a gradual increase in the expending of energy until the body becomes capable of accomplishing greater workloads without being adversely affected by the heat.
- Slow down. Muscular exercise can raise the body temperature 4 degrees Fahrenheit or more. So, plan extra time for preflight.
- Don't overdo it. If you start to feel any of the signs of heat stress, quit, get to a cool place, drink some fluids, and if you really feel bad, see a flight surgeon.

When Temperatures Soar

When temperatures soar, prepare yourself — enjoy, fly safely, and stay cool! ■

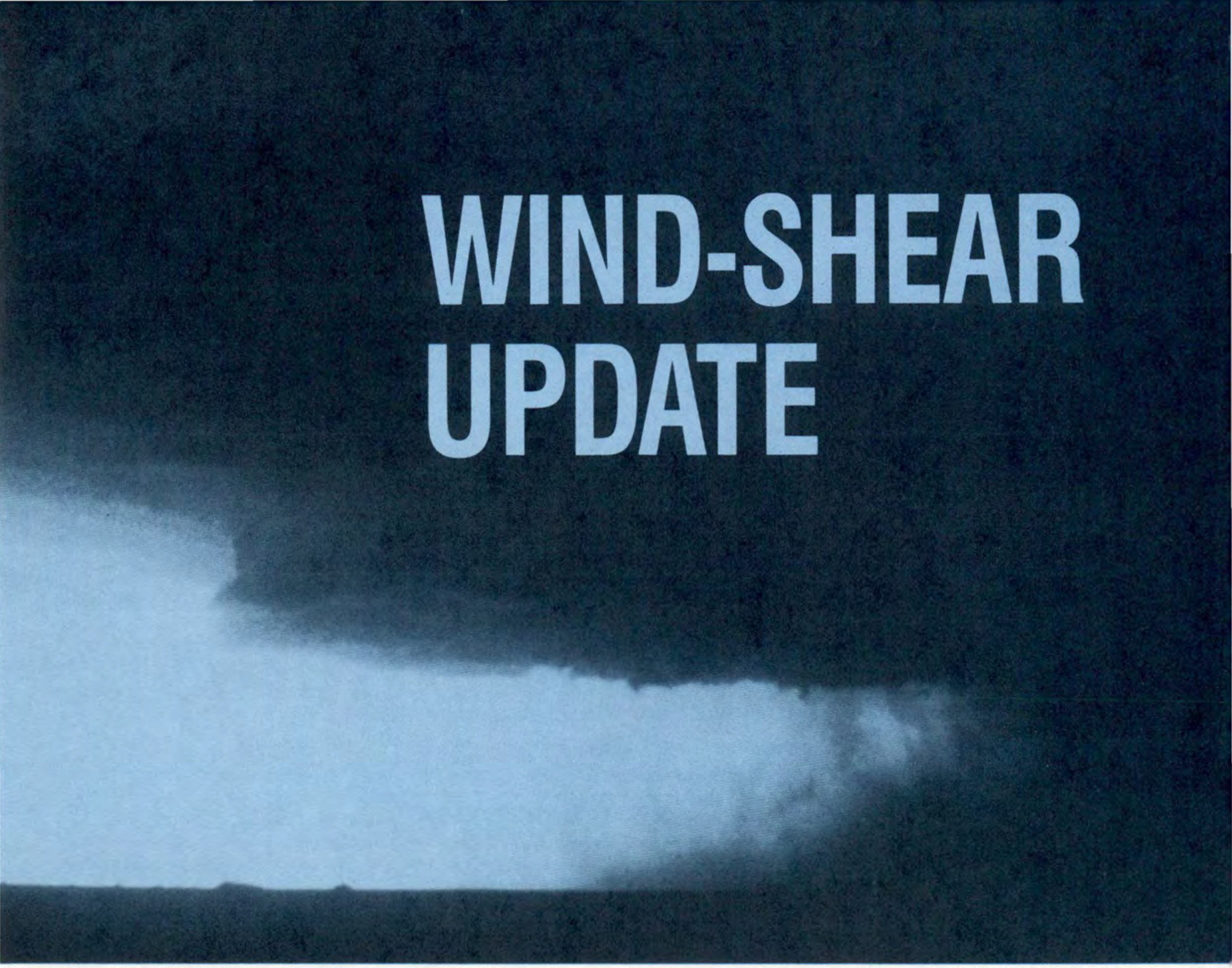
This article has been partially compiled from the *Aeromedical Handbook for Aircrew*, Capt T.G. Dobie

Heat Absorption Test on KC-135 Camouflage Paint

In April 1987, HQ SAC requested a camouflage paint scheme be developed for the KC-135A, E, and R aircraft based on the pattern used on the KC-10. The paint scheme was developed and submitted for approval. It was accepted and a prototype was painted. Almost immediately, there was concern from the field for crew safety while working in the "hotter" dark aircraft.

In August 1987, a temperature comparison test was run with a light and camouflage painted KC-135 parked side by side under identical conditions. This testing revealed that a dark-painted aircraft will heat up faster, have higher internal temperatures, and retain heat longer than a light-colored aircraft. Maximum internal temperature difference, in a closed aircraft, on a sunny 98 degrees Fahrenheit day was 20 degrees Fahrenheit. Average temperature rise in the cockpit was 13 degrees Fahrenheit.

WIND-SHEAR UPDATE



PART II

MAJOR LINN L. VAN DER VEEN
Directorate of Aerospace Safety

■ Last month's article concentrated on recent research into microburst wind shear. This month I'll pass on what the operators have been waiting for: Practical benefits from the research and investigation.

The wind-shear models and simulations have been combined with advancements in avionics and computing capability to produce several wind-shear alerting systems. Some of these even give the pilot pitch guidance for recovery from wind shear. For those aircraft without recovery guidance, the FAA has turned this research into recommended recovery techniques. Finally, I'll leave you with some guidelines for weather assessment to help keep you from needing to use any recovery techniques at all!

First, to summarize the main points of last month's update:

- Microburst wind shear can appear from a wide variety of conditions. Any convective air mass, from a single cell to a squall line or "supercell" thunderstorm, can generate a microburst that no airplane can survive.

- Microbursts generally are accompanied by rain, but dry microbursts can be generated by high-based cumulus clouds above dry, hot air. These conditions usually occur in the high plains and mountain areas of the U.S.

This photo sequence shows the development of the outflow from a wet microburst as it intensifies. The outflow can be clearly seen as it moves out from the rain shaft at the center of the microburst.

The microburst is continuing to intensify, and the ring vortex is beginning to develop to the left. The intensification will last for approximately 5 minutes after the microburst first hits the ground.

Wind-shear Update Part II

continued

■ A single downdraft can generate a series or cluster of microbursts (photo sequence and figure 1). Microbursts intensify for around 5 minutes after initial ground impact, and usually dissipate within 20 minutes of ground impact.

■ Simulations and mishap investigations have shown that pilots not trained to recognize and recover from wind shear will usually crash if they encounter moderate to severe wind shear.

■ The best bet for surviving wind shear is the same technique USAF pilots have used for years: **AVOID IT!**

— Evaluate departure and arrival weather forecasts, paying special attention to gusty winds, heavy rain, thunderstorms, low level wind-shear alerts, and convective sigmets.

— Look for visual clues of wind shear once in the aircraft: Blowing dust or rain, Virga (visible precipitation falling from high-based cumulus clouds and evaporating before hitting the ground), and the old standby, the tornado.

— Search the weather radar for convective echoes in the terminal area. If you don't have a radar, stop whining and skip this step.

— Listen for PIREPs, low-level wind-shear alerts, etc.

Alerting/Recovery Systems

There are several alerting and recovery-guidance systems in use on commercial aircraft. These systems monitor wind magnitude and duration, and aircraft rate-of-change of acceleration to provide not only a wind-shear warning, but also escape guidance. The computer generates pitch guidance that trades kinetic energy to maintain a reference flightpath angle; the aircraft actually climbs, levels, and accelerates, then climbs again.

While these are not predictive systems, they do warn the pilot before he or she could interpret aircraft instruments and ground wind reports to make the same decision. They also "manage" available energy by directing continuous and precise attitude adjustments through the violently and rapidly changing environment of a microburst encounter. The inability to manage energy, and exchange kinetic energy for altitude, has been the real aircrew deficiency in past wind-shear related mishaps.

Unfortunately, the companies that build these systems have no current contracts to equip USAF aircraft. Flight management systems on some USAF aircraft will compare predicted and actual conditions, but most aircrews must do this manually. The C-141 and C-5's Fuel Savings and Advisory System (FSAS) compares runway heading and manually input (predicted or reported) winds to INS-computed winds and issues a wind-shear warning if the actual wind component or ground speed differs more than 15 knots from predicted. FSAS incorporates an instrument panel wind-shear warning light and an aural warning beep through the interphone, but does not give any recovery guidance.

Developers of a predictive airborne wind-shear warning system hope to achieve FAA certification for flight tests this year. The system will use a forward-looking infrared sen-

The ring vortex is now clearly visible. This intense microburst will probably dissipate 10 to 20 minutes after hitting the ground. However, other microbursts may develop from the same downburst.

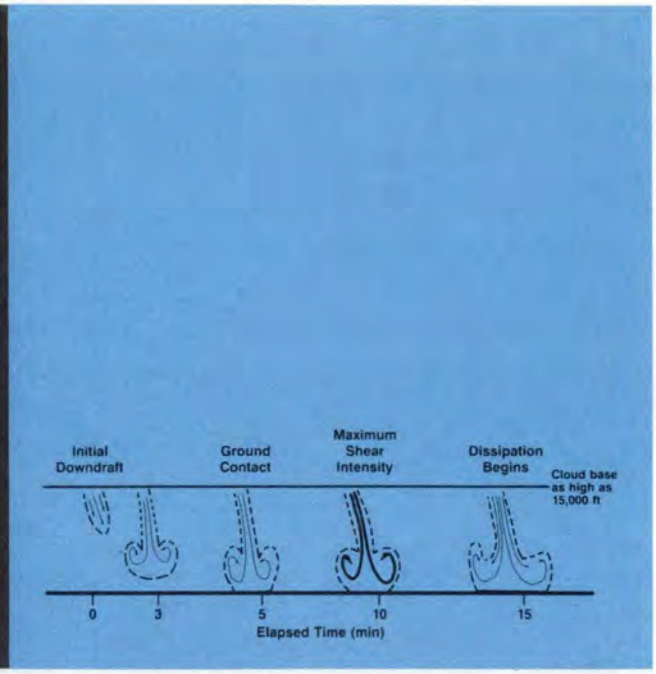


Figure 1. **Evolution of a microburst.** This diagram graphically depicts the life cycle of a typical microburst. It begins with a downdraft that reaches the ground, intensifies for 5 minutes, and then dissipates.

sor to sample the temperature of volumes of air along the flightpath, since one of the physical characteristics of a downburst, and the vortices that occur after ground impact, is a temperature differential compared to the surrounding air mass. The planned system eventually will combine airborne readings with information from ground sensors to assess horizontal and vertical shear hazards.

The Low Level Wind Shear Alert System (LLWAS) and its microburst detection deficiencies were mentioned last month. In an effort to provide viable detection, FAA contracted for an Enhanced LLWAS (ELLWAS) which will double the number of wind sensors and revise the computer algorithm monitoring the sensors. This system will provide not only a warning of significant wind changes, but also will determine resultant airspeed gain or loss. The FAA plans to field 110 systems at civil airfields in 1988 and 1989.

Another FAA effort to provide wind-shear warning is the Terminal Doppler Weather Radar (TDWR). The goal for this system is to detect 90 percent of events, with a maximum of 10 percent false warnings. The radar scans over the field from a remote site, and should provide automatic microburst and gust front detection, wind shift and precipitation prediction, and storm movement. The test system will be installed at Denver Stapleton IAP, Colorado, this summer. Eventually, FAA expects the 100 TDWRs to predict tornadoes, turbulence, and microburst precursors, and also provide microburst tracks.

Eventually, the FAA hopes to integrate TDWR, ELLWAS, and weather radar into a single tower and TRACON display. While DOD plans call for purchase of a doppler weather radar, they do not include purchase of the TDWR.

Recovery Techniques

If the attempts to avoid wind shear fail, the next steps are recognition and recovery. The place to start, of course, is the Dash 1 and its discussion of wind shear and gusts. Most USAF Dash 1s concentrate on frontal passage shear and gusts and don't include much about microbursts. Procedures are for dealing with one sudden change from headwind to tailwind or vice versa. We know now that microbursts, with varying areas of up- and downdrafts, vortices, and intensifying effects, can be much more complex than this, which also makes the recovery that much more complex.

The effects of microburst wind shear can best be generalized as a performance increase or decrease. The pilot will perceive increasing headwinds or an updraft as better-than-normal performance, such as faster acceleration on the runway, or lower power setting to maintain climb or descent gradient. Likewise, a downdraft or increasing tailwind results in a performance decrease. The National Center for Atmospheric Research's (NCAR) test pilot, who flew the microburst wind-shear sampling flights, likened this decrease to loss of an engine (one or more, depending on strength of the shear).

Think about two of the most insidious situations, both resulting from flying through the headwind/updraft portion of a microburst into the tailwind/downdraft portion.

■ First, imagine taking off with better performance than normal. Would you notice faster-than-nor-

continued

Wind-shear Update, Part II continued

mal acceleration, or better-than-usual climb rate? Most of our checks are designed to catch less-than-minimum acceleration. But the better performance may be followed by a sudden loss of lift, resulting in a descent into the ground or an obstacle off the departure end of the runway.

■ On landing, imagine gradually increasing headwinds that cause the aircraft to "balloon" and indicated airspeed to increase. You (or the autothrottle) may gradually reduce power to maintain airspeed, and reduce pitch attitude to regain glide slope. With the power back, when the downdraft/tailwind starts, power response may be too slow to fly out of the sudden descent, resulting in impact short of the runway.

Because of the complex nature of wind shear, it's impossible to come up with a "cookbook" recovery procedure. The experts all agree on selecting max thrust, but the pitch/AOA is a more difficult decision.

Figure 2
Microburst Wind-Shear Probability Guidelines

Observation	Probability of Wind Shear
1. PRESENCE OF CONVECTIVE WEATHER NEAR INTENDED FLIGHTPATH WITH:	
Localized Strong Winds (Tower reports or observed blowing dust, rings of dust, tornado-like features, etc.)	HIGH
Heavy Precipitation (Observed or radar indications of contour, red, or attenuation shadow)	HIGH
Rain shower	MEDIUM
Lightning	MEDIUM
Virga	MEDIUM
Moderate or greater turbulence (reported or radar indications)	MEDIUM
Temperature/dewpoint spread between 30 and 50° F	MEDIUM
2. ONBOARD WIND-SHEAR DETECTION SYSTEM ALERT (Reported or observed)	HIGH
3. PIREP OF AIRSPEED LOSS OR GAIN	
15 knots or greater	HIGH
Less than 15 knots	MEDIUM
4. LLWAS ALERT/WIND VELOCITY CHANGE	
20 knots or greater	HIGH
Less than 20 knots	MEDIUM
5. FORECAST OF CONVECTIVE WEATHER	LOW

NOTE: These guidelines apply to operations in the airport vicinity (within 3 miles of the point of takeoff or landing along the intended flightpath and below 1,000 feet AGL). The clues should be considered cumulative. If more than one is observed, the probability weighting should be increased. The hazard increases with the proximity to the convective weather. Weather assessment should be made continuously.

CAUTION: No quantitative means currently exist for determining the presence or intensity of microburst wind shear. Pilots must exercise caution in determining a course of action.

Researchers and pilots from the Air Line Pilots Association, the NCAR, and the National Oceanic and Atmospheric Administration agree the best solution is to first get away from the ground. The next step is to try to accelerate to build energy and stall margin, then climb again. Normal takeoff pitch attitude is a good initial goal, but if pitch attitude is increased as far as max AOA, there is no more stall margin. The rapidly changing relative wind during a wind-shear encounter may result in stall with no change in pitch attitude!

The FAA has published a technique that, while not the best in every case, was most effective in a wide variety of wind-shear situations. This program was developed in response to an NTSB recommendation that resulted from a 1984 mishap. In this incident, a United 727 encountered a dry microburst wind shear late in its takeoff roll at Denver Stapleton IAP. The effect was delayed acceleration, and the aircraft scraped the top of a 13-foot high ILS localizer antenna, 1,074 feet from the departure end of the runway as it "limped" into the air.

Simply stated, the FAA recovery technique uses pitch attitude and thrust to restore or maintain flightpath control. This recovery procedure is presented for its value as a starting point for discussion and your individual "bag of tricks." The process applies to any aircraft, but the specific procedures for flying through wind shear vary according to the flight characteristics of each aircraft. Before you use these procedures, especially the specific pitch attitude referenced later, check your flight manual for restrictions! The steps:

- Evaluate the weather for signs of wind shear, keeping in mind that avoidance is the absolute first line of defense against severe wind shear. Figure 2 is a guide for assessing weather. Not coincidentally, it's the right size to cut out* and keep with your flight planning checklist or in-flight guide.

*(Editor's note: Please don't cut this one out — 11 other people need to read this magazine. Make a copy for yourself. Thanks.)

- Keep asking, "Is it safe to continue?" Delay the approach or landing until you, your immediate supervisor, and your mother would answer "YES!"
- Use precautionary procedures when no serious threat of wind shear actually exists, but some of the indicators are present.

— On takeoff, use maximum rated thrust. Maximize available stall margin through runway selection, flap setting, and delayed rotation, all in accordance with the flight manual. Don't use pitch modes of the flight director.

— On landing, select the minimum landing flap position consistent with the field length; add an appropriate airspeed correction for gusts; avoid large thrust reductions or trim changes in response to sudden airspeed increases; and consider use of autopilot/autothrottle to provide more instrument monitoring and recognition time, but manually back up the throttle.

Not only does the microburst produce dramatic changes in windspeed and direction, it also results in large static pressure variations. Thus, pressure-sensitive flight instruments may give false and confusing readings that prompt incorrect pilot inputs.

- Compare flight instrument values of pitch attitude, rate of climb or descent, and airspeed to normal values, so deviations can be recognized early. The FAA and industry leaders in wind-shear training use the following *uncontrolled* deviations as indicators of wind shear:

15 KIAS
5 degrees pitch
500 fpm vertical speed
More than one dot off localizer glide slope.

- Act immediately if an inadvertent wind-shear encounter occurs.

— *Use maximum thrust*, avoiding engine overboost or over temp unless necessary to ensure safety.

— *Adjust pitch attitude* toward approximately 15 degrees. If the resulting flightpath is still not acceptable, consider increasing pitch even further. The pitch attitude may need to be reduced to maintain adequate stall margins; use the stick shaker/aural stall warning/AOA according to your flight manual.

— *Maintain configuration* until an acceptable flightpath is restored.

Remember the pressure changes within the shear area make the pitot-static instruments unreliable. Use pitch attitude, AOA, and radar altitude to measure the recovery.

- *Make a PIREP* as soon as conditions permit. If the microburst is still intensifying, you may save the next aircraft!

The Future

Don't count on any of the high tech wind-shear systems to be part of your immediate Air Force future! None of our aircraft are scheduled to be equipped with the latest alerting and guidance systems. The ELLWAS and TDWR efforts are strictly FAA and will go into civil airfields only. There isn't just bad news, though. USAF simulator training programs are stressing wind-shear detection and pilot reaction. Most of the simulator training our pilots receive under contract with civilian airlines or training companies does include wind-shear detection and recovery.

Regardless of whether or not the aircraft is equipped with cosmic systems of any type, the mission will always depend on YOUR judgment — your evaluation of the situation and your decision to delay or press on. That's what has kept USAF aircrews from suffering the wind-shear caused mishaps that have plagued the airlines, and with this additional knowledge, we can keep the slate clean in the future! ■

Master Sergeant Albert Kinman, Clark AB Flight Safety NCO, reviews the airfield parking plan with Lieutenant Colonel Phil Carson, PACAF Deputy Director of Safety, and Captain King Richards, Clark's Chief of Weapons Safety, to spot potential hazards.

Flight Safety NCO

Key To Safety Awareness

CMSGT AUGUST W. HARTUNG
Directorate of Aerospace Safety

■ Successful maintenance safety programs do not just happen. Any commander knows they require the involvement of key people throughout the flying unit. And one key person who acts as the liaison between the flight safety office and the maintenance complex is the flight safety NCO. It is the flight safety NCO who bridges the gap between the operational experience of the flight safety officer (FSO) and the reality of the aircraft maintenance career field.

Just what are the prerequisites to be a flight safety NCO, how did the formal training originate, and what is the role of the individual serving in such a position?

Prerequisites

Flight safety NCOs are E-5s or above with a background and expertise in aircraft maintenance. They have completed, as a minimum, a field training detachment (FTD) familiarization course on their base aircraft. In reality, most have completed multiple FTD courses covering a wide range of aircraft types. Although not a prerequisite, many are engine-run qualified on their wing or base aircraft. They must know their way around a maintenance organization and the deputy commander for maintenance (DCM) complex.

Formal Training

Although the idea of a maintenance flight safety NCO serving in a wing or base safety office has been around for a number of years, a formal training course for the job wasn't implemented until January 1987. Prior to this time, training was accomplished through on-the-job training, command-defined local training efforts, and the individual's prior experience and involvement, if any, with a flight maintenance safety program.

Working with the major commands and the Air Force Inspection and Safety Center at Norton AFB, California, Air Training Command designed a special 2-week course in 1986 for aircraft maintenance technicians who are wing or base flight safety NCOs.

Taught at Lowry AFB, Colorado, instruction includes the Air Force safety organization, concepts and principles of mishap prevention, mishap investigative techniques, analysis of program elements to identify trends, airfield and airspace criteria, Hazardous Air Traffic Report Program, Bird Aircraft Strike Hazard Program, and the Foreign Object Damage (FOD) Prevention Program.

Individuals also learn about the Base Level Maintenance Data Collection Program, the USAF Deficiency Reporting System, and general inspection procedures. Overall, the flight safety NCOs get an idea of how they fit into the "big picture" of a unit's safety program.

Role and Job Responsibilities

Just what is the role and area of responsibility of a flight safety NCO? For real world answers, I visited some serving in Pacific Air Forces (PACAF).

Republic of the Philippines At Clark Air Base, Republic of the Philippines, I talked with MSgt Albert Kinman, Flight Safety NCO for the 3d Tactical Fighter Wing (TFW). Sergeant Kinman, who has 12 years in the Air Force with a wide range of aircraft maintenance experience, explained his duties.

"First and foremost, the person serving in this capacity cannot have a 'couch-potato' attitude," explained Sergeant Kinman. "The flight safety NCO is part of a team. His or her expertise combines with the operations background of the FSO and others in the safety office to orchestrate a complete, comprehensive, and relevant flight safety program.

"The flight safety NCO must maintain liaison with the maintenance complex. This includes the DCM, assistant DCM, quality assurance (QA), maintenance analysis, plans and scheduling, debriefing, maintenance operations center or job control, the maintenance flight safety representative for each of the maintenance squadrons, the barrier maintenance folks, and especially all of those who work on the flightline and inside the repair shops and hangars."

When asked what made his job a little different from a flight safety NCO at a stateside base, Sergeant Kinman explained that flying units throughout the Pacific deploy to Clark AB eight times a year for Cope Thunder exercises. This adds an additional responsibility for the flight safety NCO to ensure maintenance people in these units receive proper safety guidance while attached to Clark.

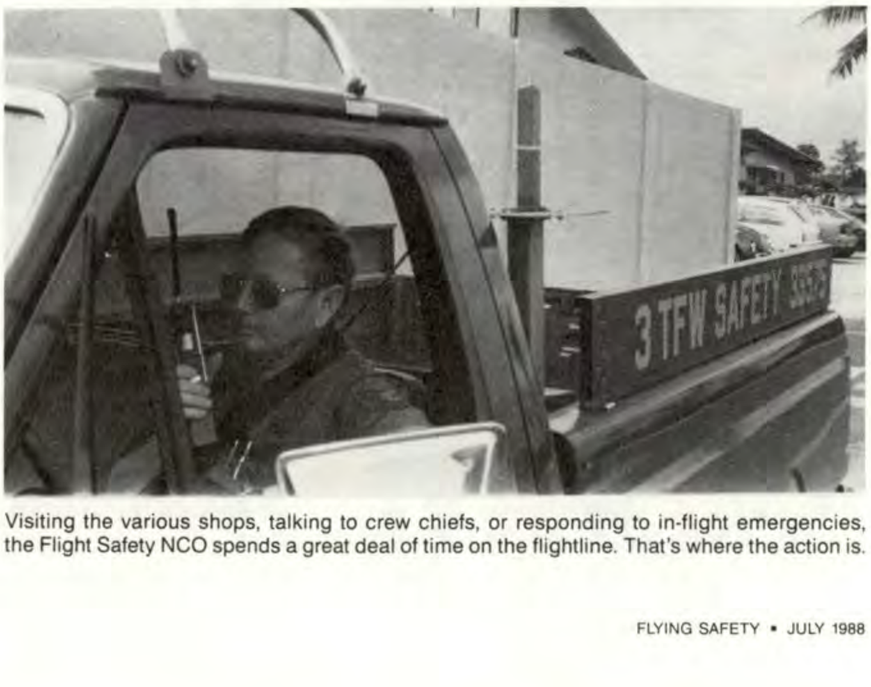
To give deployed people and all newcomers a positive approach to maintenance safety, the 3 TFW's Flight Safety NCO presents a safety briefing that stresses effective discipline as a positive factor in mishap prevention. Sergeant Kinman's candid presentation of maintenance safety is supplemented with slides depicting aircraft mishaps that occurred as a result of deviations from established maintenance practices. The silence of one such group of newly assigned individuals watching the presentation was very revealing.

"Because of the great deal of time spent on the flightline, the flight safety NCO is a tremendous asset to the wing," explained Captain King Richards, Chief of Weapons Safety for the 3 TFW. "The flight safety NCO is essential when the unit is performing integrated combat turns (ICT), the process of recovering aircraft and getting them ready for relaunch in minimum time by simultaneously servicing, fixing, loading, and arming them.

Flight safety NCOs, such as Master Sergeant Kinman, are the key to an effective safety program. Their liaison with various base agencies is a crucial part of safe operations.

"It helps to have someone such as the flight and weapons safety NCOs, along with QA, on the scene to monitor this operation because the ICT can be a hazardous operation if performed unsafely. And because we're always fine-tuning our combat readiness, folks throughout our command are performing numerous ICTs daily."

continued



Visiting the various shops, talking to crew chiefs, or responding to in-flight emergencies, the Flight Safety NCO spends a great deal of time on the flightline. That's where the action is.

As a minimum, the flight safety NCO must know his or her way around the maintenance complex. Performing required inspections of maintenance activities may include a review of the emergency equipment available to ensure serviceability and correct numbers of items, such as pry bars and aircraft jacks. The flight safety NCO also maintains a close liaison with the barrier maintenance team to keep up with the condition of runway arrestment systems and inform operations of any potentially unsafe conditions.

Japan I visited the safety office of the 316th Tactical Airlift Group, Yokota Air Base, Japan, to talk with TSgt Glenn Peterson.

Sergeant Peterson, who is responsible for both ground and flight safety programs in his unit, explained his function this way. "My role at Yokota is different from that of many flight safety NCOs at other PACAF bases, mainly because of the larger number of transient MAC aircraft that pass through here. I not only interface with our assigned C-130 maintenance folks, but also with the crew chiefs who travel with the C-141 and C-5 aircraft that frequent our base.

"If there is a problem associated with the parking ramp, such as FOD, I get involved and work with others on the base to correct the discrepancy. That's my job — interfacing with our own airlift unit, as well as those transiting our base, in a positive and productive way."

Becoming an expert with all aspects of aircraft maintenance safety isn't easy. Most flight safety NCOs come directly from the flightline with no prior safety experience. Yet virtually all have demonstrated they have the "right stuff" to fill such an important position.

Korea TSgt Tony Richardson, Flight Safety NCO for the 51 TFW at Osan Air Base, Korea, explains his job this way.

"First, you're working shoulder-to-shoulder with all the other 'troops' on the flightline. Then you come to work one day and are interviewed for the job of flight safety NCO. If you have a diversified maintenance background, technical expertise on the assigned aircraft, and personal initiative, coupled with a positive attitude toward safety, then you're selected.

"Suddenly, you realize the responsibility for a great deal of the maintenance flight safety program rests on your shoulders. Your initial feelings of total inadequacy and fear of failure are mixed with feelings of exhilaration. It's a chance to prove to yourself and others you're a professional NCO and you've got what it takes."

So it begins . . . the hectic pace of daily life as maintenance flight safety NCO, constantly juggling what the flight safety officer expects from you and what the people in the maintenance complex need from you.

Yet Sergeant Richardson says it's the most rewarding job he has performed. He remembers his predecessor telling him to get out from behind his desk and spend as much time as possible with the people on the flightline, in the repair shops, and hangars. Aftter spending 2 days with this individual, it was obvious he knew the maintenance complex and those assigned to it intimately.

"I watch people perform aircraft launch and recovery operations — not to evaluate them or write them up — but rather to point out a potential hazard or unsafe act. For example, if I see someone cross too close under an aircraft inlet while the engines are operating, I'll remind the individual of the importance of keeping a safe distance. Also, as a courtesy, I'll inform the line expediter and aircraft maintenance unit supervisors."

While touring the 51 TFW maintenance complex, I asked Sergeant Richardson about a "safety gram" displayed on a hangar office bulletin board.

"Whenever there's a mishap trend or we need to get the word out on a maintenance safety related item, I type up a 'for your information' bulletin and send it to all of our maintenance shops and flightline areas."

Returning to the safety office, we asked Lieutenant Colonel John Fox, 51 TFW's chief of safety, how he viewed the role of the flight safety NCO. "The flight safety NCO is our key link to the maintenance complex," explained the colonel. "He or she provides people, from commanders to the newest airman, with useful and ongoing flight safety information and effective crosstalk. In turn, the NCO receives a tremendous amount of feedback from those same folks. Without a doubt, the flight safety NCO is the foundation of an effective flight safety program."

At the 8 TFW, Kunsan Air Base, Korea, I talked with another flight safety NCO, TSgt James Marx.

"At first, I was apprehensive about leaving my 'comfort zone' on the flightline to take on a new job in the safety office. But then, I decided to look upon it as an opportunity to not only enhance my own career, but to also try to make a difference in the way people view safety."

Sergeant Marx, a 16-year aircraft maintenance veteran, believes visibility is a key ingredient in the mishap prevention program. He says visibility not only comes from slides, films, and posters, but even more important, from safety people and supervisors.

"Many unsafe acts are prevented when safety people, and especially supervisors, are out among the troops checking on operations and maintenance activities," said Sergeant Marx. "This principle of keeping safety visible is important to our

Maintaining currency on impoundment procedures is a necessity for any flight safety NCO. Aircraft impoundment may be required as a result of an engine failure or a bird strike, such as the one that happened to this F-4.

mishap prevention efforts and must be pursued daily."

The 8 TFW's flight safety NCO went on to explain that most mishaps are caused by personnel error, and it is up to all of us to keep our people aware of potential hazards.

When asked about the contribution of the flight safety NCO to his wing's safety program, Major Rich Welch, Chief of Flight Safety for the 8 TFW answered, "The interface of the flight safety NCO with the maintenance complex is a key ingredient to a successful flight safety program. Why? Because our flight safety NCOs bridge the gap between a safety office and the folks who maintain our aircraft. By their examples and actions, the flight safety NCOs throughout the Air Force encourage safe and proper work habits. When this is done with skill and patience, the response can be quite remarkable, as attested by our lowest mishap rate in recent years."

Application

How many mishaps have been prevented because of our Air Force Flight Safety NCO Program? We don't think anyone has the answer to that question. But we do know our flight safety NCOs are a highly visible aspect of our Air Force Mishap Prevention Program. They are proud of what they're doing, and they are proud to share their attitude of safety with others.

Clearly, the flight safety NCO plays an important role, and Lieutenant Colonel Phil Carson, Deputy Director of Safety, Headquarters PACAF, Hickam AFB, Hawaii, is pleased with the program. "The flight safety NCO is a positive factor in our Air Force Safety Program," he said. "We could not have the successful safety programs in our Air Force today if it were not for our many safety professionals — especially our NCOs. They have a heavy responsibility, but through their positive communication, they make mishap prevention a part of our everyday lives." ■

Getting out among the troops is part of the job of bridging the gap between the safety office and the people who maintain the aircraft. Here Technical Sergeant Richardson (left), 51 TFW Flight Safety NCO at Osan AB, Korea, confers with a crew chief on the status of his jet following an in-flight emergency. This personal approach makes everyone feel part of the same team.

AIRSICKNE

LT COL SAMUEL STRAUSS, MC, FS
Chief, Aeronautical Services
USAF Clinic
Kelly AFB, Texas

■ Airsickness in experienced aircrew members is an uncommon problem. However, four recent C-5 flights by the 2873d Flight Test Squadron at Kelly AFB demonstrated that airsickness can be a problem. The following summary of our experience may be helpful to other flight test squadrons as well as operational squadrons.

The squadron was tasked for a series of specially designed engineering test flights with the objective of determining the optimum wing modification required to reduce wing vibration. The test series was designed to stress the wing at various speeds, aileron settings, and aircraft attitudes. The measurements to be taken during the flights required an augmented crew to include two pilots, two flight engineers, and four flight test engineers.

The First Test

The first flight called for a series

SS

Experienced aircrew members think airsickness only happens to student fliers or nonfliers — not true! Airsickness can afflict anyone, but it can be overcome.

of banking turns, roller coaster maneuvers, aileron rolls, sideslip excursions, and stalls. The roller coaster maneuvers resulted in alternating forces of zero to two Gs per cycle (short duration positive and negative acceleration).

Shortly into the test (three to four cycles), both flight engineers reported experiencing flushing, sweating, and stomach awareness, followed by vomiting. One flight engineer became incapacitated and had to have his duties assumed by the other flight engineer who had recovered and was able to continue the test safely.

Of the four flight test engineers seated in the cargo compartment, two experienced flushing and stomach awareness, but were able to continue their duties without interruption.

After a postflight briefing with the crew, I concluded the unusual attitudes and G forces, combined with loss of visual orientation, caused the airsickness in the affected crewmembers. At no time were the pilots affected and flying safety compromised.

The Second Test

In my preflight briefing before the second test flight, I gave the crew a detailed presentation on the causes of motion sickness and appropriate preventive measures. They were briefed to eat a light, low-fat meal 1 hour before the flight, use lemon flavored candies which were distributed, keep the cockpit and cargo bay cool, minimize head movement, face forward, and maintain visual awareness. The pilot was asked to return to smooth, straight and level flight when able if sickness occurred.

During the postflight briefing with crewmembers, one flight engineer reported to me that he became airsick with one episode of vomiting. This occurred after 15 cycles and resolved immediately. He reported that he followed the preflight briefing recommendations which he believed significantly reduced his motion sickness susceptibility.

The much later onset of symptoms and the brevity of the reaction to motion sickness suggests improvement compared to the first test flight. He was able to safely continue his duties, although another flight engineer was standing by in the adjacent seat, if needed.

All other crewmembers reported that no significant motion sickness problems had occurred. They also said that expected symptoms of early motion sickness, when present, were considerably reduced compared to the first test flight.

Remaining Flights

The third and fourth test flights suggest several factors played a role in the resolution of motion sickness in susceptible crewmembers.

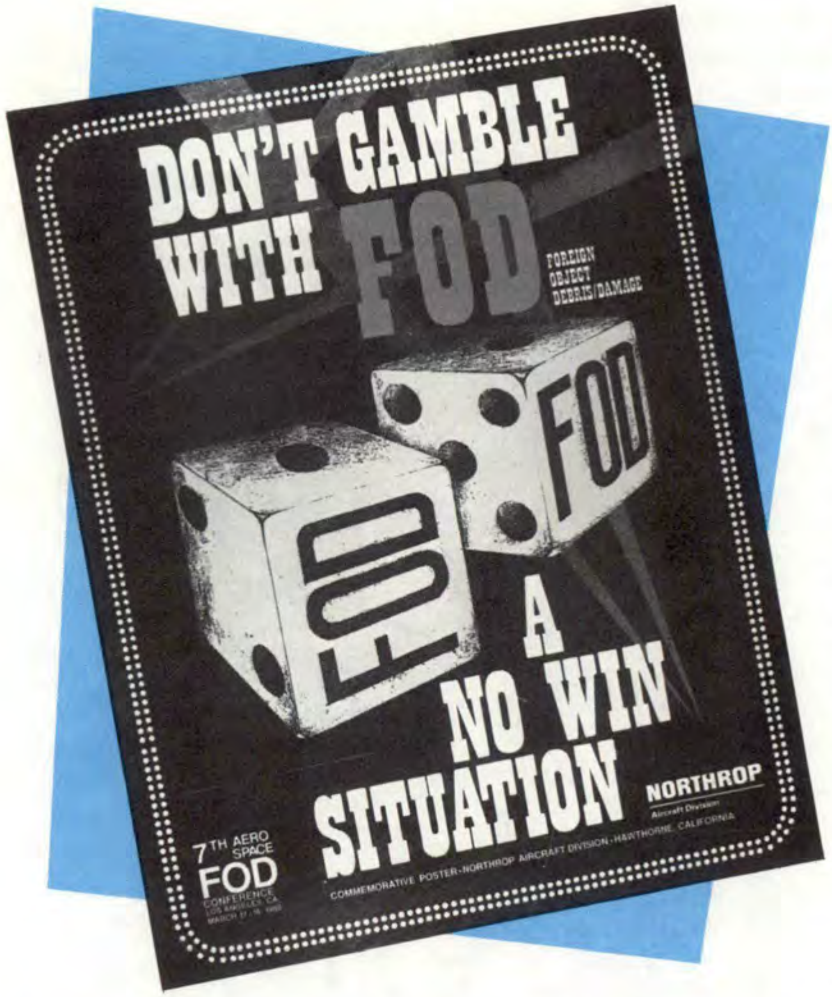
- Pilot awareness of the cause and prevention of motion sickness resulted in emphasis on smooth flight during test sequences and smooth transitions between sequences.
- The crew gave appropriate attention to recommended food and beverage consumption before and during the flights.
- Stable head orientation, reduced rapid eye movement, and situational awareness were successfully practiced.

Crew skill was reported to improve markedly during each test flight. Affected crewmembers believed head and eye movement factors were the most significant in reducing and eliminating motion sickness symptoms.

Conclusions

Motion sickness medication was not necessary at any time for the prevention or treatment of illness in spite of the fact that the crew had been briefed it could be made available, if necessary. I believe crew confidence improved remarkably with each flight. Adaptation to the test environment also contributed to the favorable outcome.

Airsickness is a normal reaction to an abnormal situation. Aircrew not accustomed to provocative maneuvers were readily trained to successfully complete a series of long, difficult, and stressful test flights. Their professionalism and skill were clearly demonstrated by their outstanding performance. ■



IT HAS TO BE FOD FREE!

CMSGT AUGUST W. HARTUNG
Directorate of Aerospace Safety

■ If you're FODding engines faster than you can rebuild them, or if you're changing FODded engines more and enjoying it less, then what you need is a FOD Prevention Program that works! FOD prevention — a traditional apple pie and motherhood item — that works? That's right! And what better place to learn what others are doing in the area of FOD prevention than at our next semiannual aerospace FOD conference?

Eighth Aerospace FOD Conference

The Aeronautical Systems Division's Safety Office at Wright-Patterson AFB, Ohio, will host the Eighth Aerospace FOD Conference 14-16 September 1988. It will be at the Holiday Inn in Fairborn, Ohio. Everyone associated with FOD prevention, especially our military representatives, should attend.

What Is It All About?

The 2-day conference, which is held in the spring and fall, is hosted by various aerospace organizations on a rotating basis. The primary objective is to keep the FOD communications link open so the aerospace industry will continue to profit from the FOD related experiences and the active participation of those attending.

Like the past six conferences, the one hosted by Northrop Corporation in Los Angeles, California, during March 1988, was aimed at sharing successful techniques to reduce foreign object debris and damage. The audience of 180 attendees included representatives of the major aircraft manufacturers, tool corporations, airline industry, military, and the National Aeronautics and Space Administration (NASA).

Keynote speaker for the event was Navy Captain and NASA astronaut John Creighton. Captain Creighton, pilot of shuttle mission STS 51-G in 1985, explained the potential FOD problems associated during launch and in flight. The audience was surprised to hear about the screwdriver that came loose from its tether while the NASA astronaut and his crew were performing maintenance outside their shuttle vehicle in space. "It simply got away from us," explained Captain Creighton. "That same tool is still in space orbiting our planet."

"This conference gave me the opportunity to meet and talk with others and compare notes and ideas about FOD prevention," said MSgt Ted Skinner, FOD Prevention NCO for the 355th Tactical Training Wing at Davis-Monthan AFB, Arizona. Sergeant Skinner, who briefed the group about his unit's A-10 FOD prevention program, went on to say he left the conference with a better understanding of what others are doing.

"I enjoyed the variety of briefings and opportunity for discussion," commented MSgt Randy Duty, FOD Prevention NCO for the 37th Tactical Fighter Wing (TFW) at George AFB, California. When asked if there was anything missing from the conference, Sergeant Duty thought there should have been more Air Force members present, especially those from the major command and numbered Air Force levels. "Although there were many attendees from the airlines, contractors and subcontractors, there were few 'blue-suiters,' and that's sad. There was a lot of valuable information that our military members missed."

Another attendee from George AFB, California, was MSgt Joe Clement, FOD Prevention NCO for the 35 TFW. "I'm amazed at the interest in FOD prevention shown by the aerospace industry," said the sergeant. "I was especially impressed with the tour of the Northrop fighter production facility. It's obvious that those in industry are working very hard to prevent foreign objects from entering the aircraft during production."

Under the leadership of Gayle McCormick, FOD Prevention Administrator for Textron Aerostructures, Nashville, Tennessee, and Tom Yeager, FOD Prevention Administrator for Rockwell International, Palmdale, California, attendance at the conference has grown to over 180 persons — quite an increase from the original 9 B1-B representatives who met in Palmdale, California, just 3 years ago.

Irene Fretz, FOD Program Coordinator for Convair Division of General Dynamics, San Diego, California, said she liked the way people can meet and share their films, posters, training, and prevention procedures.

"For example, Lieutenant Colonel Horst Kronenwett GAF, pilot and flight safety action officer with the Air Force Inspection and Safety Center, Norton AFB, California, gave an informative presentation on FOD prevention from a pilot's viewpoint," explained Miss Fretz. "Still another presentation by Gary Chaplin, President of FOD Control Corporation, Highland, California, dealt with a new product called the 'FOD Buster Sweeper.' This device can be towed behind any vehicle having a pintle hook and picks up debris in its path as the tow vehicle moves about."

The semiannual aerospace FOD conference is an opportunity for concerned people from all areas of the aerospace industry to get together and share ideas. The presentations range from controlling FOD during manufacture to FOD in space.

Many Air Force FOD managers are finding these conferences valuable. They discover new equipment for cleaning up FOD, learn about successful prevention programs used by aerospace companies, and share their own expertise in these areas.

A Successful Gathering

"I'm extremely pleased with the tremendous interest in these conferences as companies and military units become more aware of the benefits," said conference coordinator Gayle McCormick. "It's gratifying to see people working together to solve a common problem."

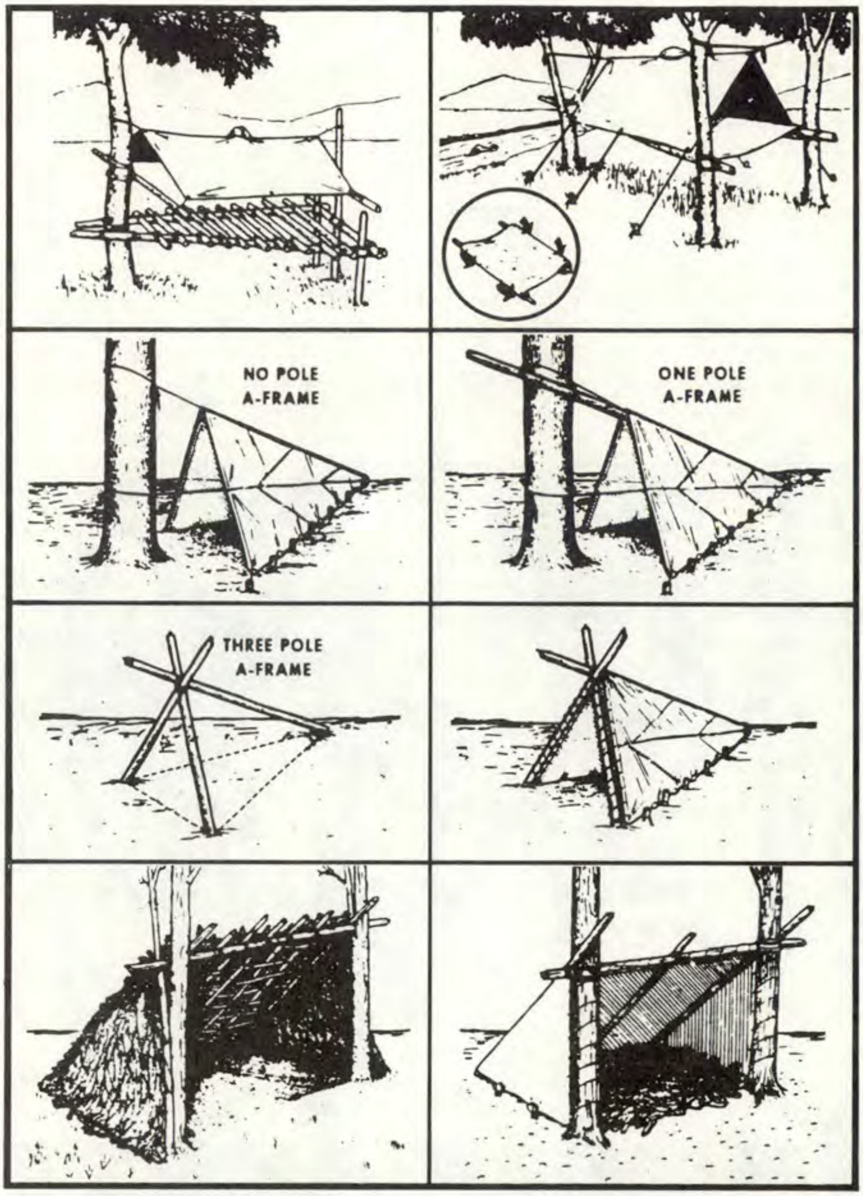
Terry Mohr, a quality assurance engineer with Northrop Corporation, agreed by saying, "This is an industry-wide conference, addressing industry-wide FOD issues. As a team, we share in both the problems and the solutions of FOD. Participation and contributions are what make these gatherings successful."

Anyone interested in attending this conference should contact either Danny Tipton, ASD/SEG, Wright-Patterson AFB, Ohio, 45433-6503 (AV 785-4212), or Gayle McCormick, Textron Aerostructures, Department 421, P.O. Box 210, Nashville, Tennessee, 37202. Her phone number is (615) 361-2008. ■

SHELTER TIPS

USAF Survival School
Fairchild AFB, Washington

■ As an aircrew member, you face the possibility of having to jump out of your aircraft and spend some time in remote areas. If you are also one who enjoys hiking, fishing, hunting, and other wilderness area sports, you have even more chance of being forced to spend an unplanned night or two in the wilderness. Regardless of how you got there, you may need to provide shelter from the environment. There are several things you should consider in conjunction with shelter needs. To refresh your survival knowledge, here are some tips from the Air Force Survival School.



Shelters don't have to be elaborate. First, select a proper site for the shelter. Then use the best available materials and build to suit the climate.

Selecting a Site

Where you build your shelter is just as important as the shelter itself. A survivor's campsite should be near food, water, fuel, and have access to an open area where signals can be constructed. The site should provide natural protection from the environment and have enough materials nearby to construct a shelter.

When selecting a site, consider some of the hazards of wilderness areas. Dead standing trees, which may be blown down by the wind, can cause injury or death, and you should avoid building your shelter near them.

You should also avoid building the shelter in areas which may be prone to mudslides or avalanches. Pick a spot away from areas that are susceptible to flash floods, such as dry stream beds. A mountain storm miles away can fill these with raging torrents of water.

Constructing the Shelter

The type of shelter you need varies with the situation; however, it should be easy to construct. After selecting a suitable campsite, you should select, collect, and prepare the materials needed to construct your shelter.

If you are constructing your shelter with a wood frame, remove all rough edges and stubs from the poles. This will not only prevent tearing of the cover material, but will reduce your chances of being injured by a jagged edge. The covering of your shelter can be anything from a sheet of plastic to pine boughs draped over the frame. Remember that your framework should be strong enough to support whatever material you choose for a covering.

Before building the shelter, prepare the site by brushing away all rocks and twigs from the sleeping area and removing any overhanging vegetation that may be in your way when you construct the shelter.

If your cover material is not waterproof, construct your shelter at an angle that allows moisture to run down the side, and stretch the material tightly across the framework to prevent rain or snow from pooling in the wrinkles.

For more detailed instructions on building specific types of shelters, refer to AFP 64-5, Aircrew Survival, and AFR 64-4, Volume 1, Survival Training. ■

FSO's CORNER

GENERAL AVIATION and TELEVISION

CAPTAIN DALE T. PIERCE
919th Special Operations Group
Eglin AFB Aux Fld 3, Florida

■ Would you like to have the general aviation community in your area know where you will be flying today? Would you like to tell them on a daily basis? The folks at the 27th Tactical Fighter Wing (TFW) can and do, Monday through Friday, 52 weeks per year.

Their system works like this. One of the local television stations telecasts a 30-minute aviation weather program every weekday morning. At the end of the show, the 27 TFW has a 1-minute spot during which they provide an overview of the day's activities.

The 60-second spot starts with a view of the wing logo and some opening remarks. Then the speaker goes on to identify times of flight and the low-level route of the day, with an associated chart depicting the route. Areas of intense activity are also provided when applicable. Finally, they provide the telephone number of the 27 TFW public affairs office for any viewer who might have questions.

The series of spots is done on videotapes and aired at the appropriate time by the television station. The series of videotapes covers the various routes flown by the 27 TFW. To manage the program, all the airspace manager has to do is call the station and tell them which tape to play the next morning.

The program takes some effort to put together, but not much to maintain. The television station likes the program so well they offered a 15-minute spot once per month in addition to the MACA spot.

Major Glen "Dutch" Zevenbergen provided this month's FSO's Corner idea. He is the airspace manager for the 27 TFW at Cannon AFB, New Mexico, AUTOVON 681-2277.

The FSOs of the Air Force need to hear about your good idea. What are you doing in your program that could help other FSOs if they knew about it? If you have an idea about how to do a better job, call me (Dale Pierce) at AUTOVON 579-7450 (SMOTEC) or send your name, AUTOVON number, and a brief description of your idea to 919 SOG/SEF, Duke Field, Florida, 32542-6005. ■

There "He" Was . . . IPs make mistakes, too.

CAPTAIN DALE T. PIERCE
919th Special Operations Group
Eglin AFB Aux Fld 3, Florida

■ At a recent IP meeting, one attendee stood to address his peers. His words went something like this.

"It started out as a real 'ho hum' night. We briefed and decided to go '20 early.'

"Mission planning and preflight went smoothly, for the most part. As is sometimes the case, we had a maintenance problem that resulted in a 30-minute delay. No big deal — '20 early' was just a goal anyway.

"Then, during the before-taxi checklist, we got a call from ATC saying that our takeoff clearance would be delayed a few minutes. The computer had gone down. I wondered what else could go wrong. Now, we were really getting aggravated with the whole mess and discussed our varying degrees of disgust on 'hot mike.'

"After what seemed like an eternity, we received our IFR clearance and were cleared onto the runway for takeoff. I pushed the throttles forward. As we accelerated down the runway, the engineer called, 'Pull back No. 3 a little, pilot.'

"As the aircraft lifted off, the controls felt spongy, and the aircraft didn't want to climb as it should. All sorts of things went rushing through my mind as I called 'gear up.' I saw the copilot reach for the landing gear handle and raise it. I felt the gear being retracted into the wells.

"Still, the aircraft felt spongy and heavy. I complained to the copilot and engineer. The engineer scanned the instruments and said that everything looked normal.

"I called for flaps up. I saw the copilot's hand reach for the flaps. In a moment, the copilot responded, 'The flaps are already up.' That was my first flaps-up takeoff in a C-130. I'm glad I didn't lose an engine."

It's really important to ensure that something hasn't fallen through the cracks when your routine has been interrupted. ■

Safety Warrior

Remembering the Korean War

CMSGT AUGUST W. HARTUNG
Directorate of Aerospace Safety

■ The Cold War between East and West was rudely shattered in the Far East on 25 June 1950, when North Korean troops, spearheaded by Russian-built tanks, crossed the 38th Parallel to begin an invasion of South Korea. When the United Nations (UN) asked its members to aid the South Korean nation, President Truman sent U.S. troops to assist. We recount two such battles in the area where Osan Air Base is now located and salute present-day South Korea. — Ed.

Remembering a Past

American involvement with Korea began over 100 years ago with the signing of the Shufeldt Treaty of Amity and Commerce in May 1882. That was the first such agreement between an isolationist Korea, known at that time as the "Hermit Kingdom," and any western nation.

The U.S., however, maintained little interest in Korea, except in the areas of commerce and missionary work, until the end of World War II when President Roosevelt declared that "the right of self-determination" applied to all nations of the world. The restoration of Korea's independence was included among the Allies' war objectives to strip Japan of illegal territorial acquisitions.

After agreement among the Allies, Korea was divided at the 38th Parallel for convenience in accepting the surrender of Japanese forces on the peninsula. It was never intended, at least by the U.S., that the division become permanent. A unified Korea was to become free and independent, as pledged by the Allies. Subsequent disagreement between the U.S. and Russia — and later between Russia and the UN — over general elections and unification led to a stalemate.

Unable to alter Russia's adamant refusal to recognize its authority in the north, the UN sponsored elections south of the 38th Parallel which led to establishment of the Republic of Korea (ROK) on August 15, 1948. U.S. military government ended and American forces, except for the Korean Military Advisory Group (KMAG) — less than 500 men — were totally withdrawn by the middle of 1949.

Little more than a year later, during the pre-dawn hours on a rainy Sunday, the 25th of June 1950, Communist forces launched a surprise attack. The U.S. opted to intervene at the request of the hard-pressed ROK Government. U.S. troops returned to the ROK, spearheading a UN-authorized defense in a war that lasted 3 years.

Two Significant Battles

The First U.S. Battle The first Korean War battle between North Korean and U.S. forces was fought just a few miles north of present day Osan Air Base (constructed in the summer of 1951). Following the orders of Major General William F. Dean, commander of the 24th Infantry Division, a task force of two infantry companies and an artillery battalion was sent to Korea on July 1, 1950.

Under the command of Lieutenant Colonel Charles B. Smith, this 408-man contingent was tasked to meet the oncoming North Koreans in an effort to bolster the faltering Korean army and provide a delaying action until the rest of the division could be transported to the peninsula.

In the early hours of 25 June 1950, the North Koreans launched their powerful offensive against the Republic of Korea. Suddenly, the attention of the entire world was focused on that small, strategically located Asiatic nation.

On July 5, Task Force Smith was hit by the enemy between the towns of Osan and Suwon. For 7 hours, the task force held against an entire Communist division with 37 tanks to support it. Though outnumbered 10 to 1, the men of Task Force Smith fought gallantly before withdrawing to the south.

Just north of Chonan, the task force fought another delaying action, but it was soon pulled back to Taejon where General Dean had established his headquarters. Task Force Smith fought for 16 days, terminating its delaying action by holding the North Korean army outside of Taejon. That enabled the 24th Infantry Division to land at Pusan and hold the Pusan Perimeter until the famous Inchon landing on September 15, 1950.

Task Force Smith Remembered

Topping a hill a few miles north of Osan Air Base on the road to Suwon stands a monument constructed by Companies B and C of the 3d Engineer Battalion, 24th Infantry Division, in honor of the men who gave their lives in the valley. The inscription on the plaque, in both English and Korean, reads:

"In commemoration of this site, 5 July 1950, 408 men of Task Force Smith, 21st Infantry Regiment and Battery, 57th Field Artillery Battalion, 24th Infantry Division, fought the initial action between United States and Communist troops."

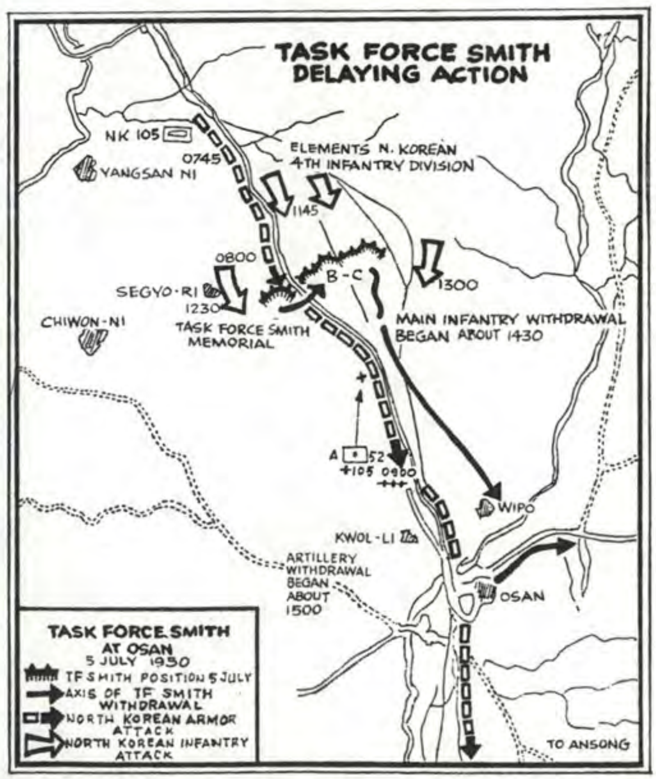
In the months after this first battle, U.S. Army, United Nations, and ROK forces pushed the enemy north across the 38th Parallel, and then all the way to the Yalu River.

But suddenly a new phase of the war began when Chinese communist "volunteers" staged their surprise winter mass attack that spoiled Gen Douglas MacArthur's promise to have our boys home by Christmas. The U.N. forces were pushed back below the 38th Parallel by overwhelming numbers of fresh, well-equipped and well-disciplined Chinese forces.

As the war continued, many battles were fought. One such battle

continued

Korea, about half the size of California, was the scene of bitter fighting and heavy casualties as the front lines see-sawed up and down the rugged peninsula. Some shifts were rapid, others slow.



Task Force Smith was the first American unit to meet the North Koreans in battle. Though hopelessly outnumbered, these gallant men delayed the North Korean advance until reinforcements landed.

took place on a ridge known in military annals as "Bayonet Hill."

First Bayonet Charge The area of what is now Osan Air Base is also remembered as the location for the first U.S. Army company-strength bayonet charge since World War I. That charge, which took place on 7 February 1951, was part of a larger plan to clear the Republic of Korea of all Communist troops south of Seoul.

"Bayonet Hill," or Hill 180, as it was called during the Korean War, lay between the exhausted Chinese Communist and North Korean forces and General Matthew Ridgeway's revitalized 8th U.S. Army. After being driven back during the last months of 1950 by Chinese forces, U.S. troops regrouped and were ready in late January 1951, to probe the overextended, undersupplied Chinese and North Koreans.

Ridgeway sent the 27th Infantry Regiment "Wolfhounds" north toward Osan as the vanguard for an all-out U.N. assault. The E Company, part of the "Wolfhound" contingent, was commanded by a tough, World War II hardened officer — Captain Lewis L. Millet.

Millet's company made contact on the morning of February 7 with Communist troops dug in atop brown, stubble-covered Hill 180 overlooking the main supply route to Seoul. Captain Millet knew the enemy would have to be driven off the hill and wiped out, or the Communist High Command in Seoul would be forewarned that the U.N. offensive was underway.

Millet's men discovered the enemy's camouflaged gunsite protecting the south approach to Hill 180. The Americans fixed their bayonets and followed their captain up the hill, which was dotted with Chinese and North Korean defenders.

The command "Fix Bayonets" had hardly been heard in more than 30 years. But for weeks prior to the Hill 180 encounter, Millet had drilled his men for hours in the skills of using the bayonet. He intended to prove a point, and did. Brigadier General S.L.A. Marshall, the noted U.S. Army historian and observer of the Korean War, called it "the greatest bayonet attack by U.S. soldiers since Cold Harbor in the Civil War."

The American advance was slow and torturous in icy, wintry weather under an enemy hail of gunfire and grenades which rained down from the hill. The hand-to-hand combat was vicious.

Once close enough to make out emplacements on the hillside, Millet saw the antitank gun nest. Although wounded by a grenade during the charge, he rushed the gun nest himself, killing the three-man gun crew with his own bayonet, silencing the gun.

More than 200 enemy soldiers had been holding the hill that day. But, after Captain Millet and his men slashed their way to the top, 47 Chinese and North Korean soldiers lay dead — 18 killed solely by bayonet. The E Company lost nine of its men. The remainder of the enemy defenders had fled the ridge after seeing the devastation caused by the knife-wielding Americans.

In August 1951, Captain Millet was awarded the Congressional Medal of Honor for leading the charge up Hill 180.

"Bayonet Hill" Remembered Today on this same hill are officers' quarters, a few base exchange facilities, a chapel, and communications antennae. At its foot sits the command building for U.S. Air Forces, Korea.

Hill 180, strategic in 1951 and scene of some of the Korean War's most bitter fighting, now looks like nothing more than another small, dusty hill in the South Korean countryside.

Yet, because of its distinction, there is a monument at the top of the hill across from the officers' quarters, dedicated to those who gave their lives in the defense of freedom.

Saluting the Present

Things have changed greatly since our early involvement in the Korean War, when the Army fought bravely in the hilly countryside of what is now Osan Air Base.

Today, the area is home of the 51st Tactical Fighter Wing, which is composed of three flying squadrons in three separate locations: Osan, Suwon, and Taegu air bases. The 36th Tactical Fighter Squadron (TFS) at Osan flies F-4E Phantoms in an air superiority role. The 25 TFS at Suwon AB, 16 miles north of Osan, flies A-10 Thunderbolt IIs, providing close air support for ground forces. From Taegu AB, 160 miles south of Osan, the 479 TFS also flies F-4E Phantoms in their air superiority role. Osan AB is also the home for OV-10 Bronco and RF-4C associate units, as well as the 51 TFW's higher headquarters, 7th Air Force.

As the infantrymen defended and supported Korea during the early 1950's, our military mission remains the same today: To deter North Korea from renewing aggression on the Korean Peninsula.

When the Armistice Agreement was signed by the opposing military commanders at 1000 hours on 27 July 1953, only the active combat ceased. More than 30 years later, the situation remains relatively the same; no open hostilities . . . but no peace either. We remember and salute South Korea's efforts — yesterday and today. ■

We thank the people in the Historian Office at Osan Air Base, South Korea, for their assisting in compiling material for this article.

OPS

Automatic Canopy

■ After clearing the runway, the F-4 crew raised their canopies simultaneously. The pilot heard a loud hiss, and the front canopy lowered at a near freefall rate. A few seconds later, the rear canopy fell closed. They stopped the aircraft and called for egress technicians.

The problem was caused by a hole in the down pneumatic line for the front canopy. The hole resulted from electrical arcing from the rear cockpit turn and slip indicator electrical connector.

The turn and slip indicator had been installed without a required spacer. This allowed the front canopy pneumatic hose to rub against the connector. It finally wore through the insulation and caused the wires to short.

Remember, if you want to keep your hands and arms, keep them off the canopy rails. The odds against the canopy falling are slim, but why take the chance?

Oops!

A pilot and an IP were practicing navigation. The pilot reached down to change frequencies on the UHF radio. He was still looking at his map and accidentally pushed the external stores emergency release button located near the radio.

The button worked as designed and dropped the 150-gallon external fuel tank and rocket pod. The IP took control but could only watch the external stores tumble into an open field.

It's important to know the cockpit well enough to be able to find a switch without looking, if necessary. But, don't activate one without being sure it's the right one.

Only a Cough

A B-52 navigator had experienced a mild cough, congestion, and sore throat for a week. On the morning he was scheduled to fly, he only had mild congestion. Since he could perform a valsalva successfully, he decided he was okay to fly.

Just prior to entering the low level portion of the mission, he noted mild sinus congestion. Afrin spray cleared it up, and he had no more trouble until final descent for landing.

At 5,000 feet, the navigator experienced severe sinus pain and Afrin was no help. The aircraft commander stopped the descent and climbed back up to 8,000 feet. From there the navigator was able to endure a slow descent to landing with only minor sinus pain.

He was met and examined by the flight surgeon who diagnosed sinusitis. The navigator was DNIF for 10 days. He was lucky the problem wasn't more severe.

The navigator thought he was okay to fly if he could valsalva. What he didn't understand is that the valsalva has nothing to do with venting the sinuses.

Remember, don't self-diagnose or self-medicate. Only the flight surgeons are qualified to do that.

Two Thorns

ONE THORN OF EXPERIENCE IS WORTH A WHOLE WILDERNESS OF WARNING.

— James Russell Lowell

Navigating the thicket of controlled airspace signified by those solid blue concentric circles on the sectional charts is one of the thorniest problems of all, judging from reports ASRS receives of inadvertent TCA penetrations.

TOPICS

The two reports below tell a familiar tale, of VFR pilots who did all the right things, except one . . .

■ "I departed VFR and contacted Departure. I told them who I was, where I was, requested 7,500 feet and gave my intentions. I was told, Roger, to squawk * * * * and maintain VFR. After climbing through 4,500 feet, the controller asked me to verify altitude (I had Mode C). I said '4,500 feet and climbing.' He then said to descend and maintain 3,000 feet. Three months later, I'm notified from the FAA of entering a TCA without authorization . . . "

A similar tale from another reporter, this one a professional airline pilot out for some flying in his own small airplane.

■ "On initial contact, I asked for VFR advisories westbound, 4,500 feet. I was given a squawk and subsequent radar contact established. As I climbed through 3,000 feet MSL, the departure controller called me and stated, ' . . . you just violated TCA airspace.' I replied that the TCA was the reason that I was on Departure. Immediately, another controller came on and said I had to specifically ask for clearance through the TCA. . . . I work with ATC on a continuing basis in my job as an airline pilot, which could make a difference between that type of flying and flying my own plane. By that I mean being used to operating in the system in one type of aircraft and what to expect from that system does not necessarily apply to the other."

The second reporter discovered (and by now the first, too) that the system works differently for VFR flights. Two-way communication, a discrete squawk, and radar contact do *not* constitute clearance to transit a TCA. As these thorns of experience testify — it is the pilot's responsibility to ask for TCA clearance when VFR. ■

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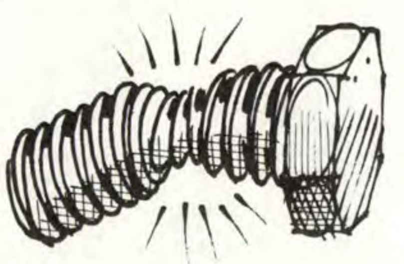
MAINTENANCE MATTERS

CANOPY TROUBLE

■ In preparation for towing an F-16, the crew chief opened the canopy to allow entrance for the brake rider. When the canopy was approximately ¾ of the way up, a 40-knot gust of wind caught it, pushing it up and allowing the canopy pullers and guides to disengage. The canopy then fell forward, striking the head up display and ejection seat.

During high wind conditions or areas of jet aircraft exhaust blasts, extra care must be taken when opening canopies and access doors or panels. If an aircraft absolutely must be towed under such conditions, perhaps consideration should be given to leaving the canopy closed while maintainers walk with the chocks on each side of the slowly towed aircraft.



TORQUE TROUBLE

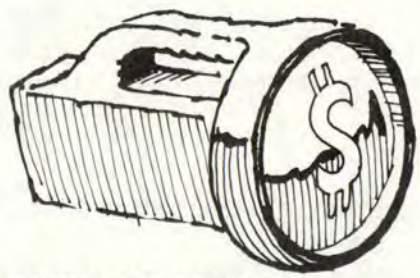
The necessity for proper torque on aircraft nuts, bolts, and all types of components has always been recognized. But sometimes it takes a mishap to remind us of the importance of correct torque values.

Flying a "live fire" mission, the fighter pilot attained weapons parameters and squeezed the trigger, hoping his heat-seeker missile would hit the drone target.

Although the rocket motor fired normally, the missile failed to depart the launcher rail. A chase aircraft observed fire and smoke behind the missile launcher. After performing a controllability check, the pilot of the mishap jet landed safely.

An inspection of the launcher detents put the finger on the trouble. The detents were considerably overtorqued, preventing the missile from leaving the rail. In addition, those responsible for ensuring the detent pressure checks were correct failed to do so.

The minute or two involved in verifying and complying with proper tech order torque specifications is time well spent.



WORTH THE PRICE

In preparation for a maintenance engine run, the crew chief of a multiengine aircraft inspected an engine using a military issued lantern. Next, a check of the composite tool kit was performed. All items were in place.

The engine was run with no indication of damage or vibration. But a post-run check revealed evidence of foreign object damage (FOD). The engine was removed and borescoped, whereupon pieces of plastic were found throughout the fan blades and core compressor. The lantern used for the pre-engine run was an extra, and it was missing.

Maintaining a "full attack" against FOD is no easy job, but the reward in readiness is worth the price.

AND THEN THERE WERE NINE

Lately, there have been several cases where fingertips were severely cut or completely severed by the improper removal or installation of aircraft components. Here is one such mishap.

Three pneudraulics technicians, one 7-level and two 5-levels, were installing the left stabilizer actuator in an F-111. While the 7-level and one assistant were on top of the aircraft, the third member supported the aft end of the actuator from the ground.

In order to install the forward pin, the 7-level aligned the clevis with the forward bearing hole of the actuator. While holding the weight of the forward end of the actuator with his right hand, the 7-level next checked the alignment of the clevis and the actuator using his left middle finger.

Suddenly, the 7-level slipped and lost control of the actuator, which slid and amputated the technician's left middle finger. The actuator, which weighs 125 pounds, was not supported by a sling and hoist as required by the applicable tech data.

Those of you who have performed similar maintenance operations know that heavy components can drop or shift easily if not properly supported. If any fingers are in the way, the result can be very painful indeed. Try not to be the next victim. If the book calls for a hoist or support device, use it. Better to be safe than sorry. ■

Excellence Circles

Excellence in anything comes as a result of careful planning, attention to detail, and a team effort. An approach such as this not only makes people feel they are an important part of the team, it also encourages more creativity in solving the really difficult problems. Good ideas that otherwise may not have been brought to light now are made available. Not only that, but the synergistic effect of a group working together stimulates everyone's imagination to produce even more solutions. One idea can easily inspire many improved variations.

CAPTAIN CHARLES H. PORTER
552 AWACW
Tinker AFB, Oklahoma

■ How many times have you seen something and said, "They could have done that better," or "If they'd asked me, I could have told them it wouldn't work!" Everyone has, at one point or another, and the reason is that we all have some pretty darn good ideas on better ways to do things.

This is the principle that the 552d Airborne Warning and Control Wing (AWACW) has based its Excellence Circles on. The "Circles" are used to identify longstanding problems to come up with unified maintenance solutions.

The group, chaired by the Assistant Deputy Commander for Maintenance (ADCM), has a permanent member core of maintenance analysis, the organizer and founder of the Circles, quality assurance, training, and the three maintenance squadron supervision sections (Aircraft Generation, Component Repair, and Equipment Maintenance). The group is augmented by subject matter experts from the maintenance shops and aerospace contractor offices to provide a wide base of information.

The problems and concerns are addressed in open forum and mediated by the ADCM. Some of the items already worked include an overheat problem with the aft forced air system on the E-3 Sentry aircraft and problems in the E-3 surveillance radar high voltage system.

Using a locally devised form, minutes are taken and offices of primary responsibility are assigned. Formal minutes are then published and distributed to all concerned work centers.

Because they address areas from safety to troubleshooting, "Excellence Circles" are paying big dividends to the airborne warning and control systems community. This program received laudatory mention during a 1987 Tactical Air Command (TAC) maintenance staff assistance team visit.

Similar actions in the mishap prevention function are underway at several other TAC units. Just remember, everyone has an idea on how to do things better. Perhaps it's time to change a lot of those things that get done because "That's the way we've always done it."

For more information on this initiative, call me (Charles Porter) at AUTOVON 884-7450, or write to 552 AWACW/MASA, Tinker AFB, Oklahoma 73145-6503. ■

MAIL CALL

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

"TOO LITTLE, TOO LATE"

■ Reference your article titled "Too Little, Too Late," in your March 1988 *Flying Safety* magazine. The near mishap is near and dear to my heart because I was the IP in the pit during that incident.

I resent the implication throughout the entire article inferring how stupid we were during the incident. True, there was nothing *found* to be wrong with the aircraft after the fact; however, the aircraft has had a history of transient brake problems, the most recent being experienced by the wing DO the weekend prior to the incident. He had 12,000 feet of runway to play with, so he cycled the antiskid, and that seemed to solve his problem. (Unfortunately for us, he did not write the problem up.)

We did not have that luxury. It was quite fortunate that we did not lose the jet and possibly our lives over your "nothing wrong with the aircraft." This was his third ride in theater (third with me in the pit, also), and I had gotten on his case both previous times about early braking. I also emphasized early braking in our mission brief for the mishap sortie.

The brakes were working at first, and then failed at about 80 knots while the pilot was distracted by the aircraft drifting to the right side of the runway. The pilot then fully depressed the brake pedals with no effect. Unfortunately, by then we had less than 2,000 feet of runway left. Any F-4 driver realizes that 2,000 feet is plenty of runway to stop a Rhino doing 80 knots. I fully appreciate the lesson you are attempting to bring out. However, based on what really happened, the article is very, very biased and totally misrepresents the actual events of our mishap.

(Name withheld by the Editor)

We never intended to infer that anyone involved in this mishap was stupid, and we apologize if you got that feeling. We sanitize the reports on which the articles are based to avoid identifying or embarrassing the people involved.

We try to present the facts and lessons learned without bias. The purpose is to prevent a similar thing from happening to someone else. We can all learn from the mistakes, misfortunes, good judgment, or good luck of others as well as from our own. ■

What Would You Do?

Things That Go Bump

■ Shortly after takeoff as the pilot of a fighter aircraft deselected afterburner, both crewmembers heard a thump. At the same time, ground witnesses saw parts falling from the aircraft. Tower informed the aircrew that they apparently had lost a tire tread. The aircrew had their wingman check them over. The wingman could not see any damage.

What Would You Do?

a. Continue the mission since there was no obvious damage.
b. Abort the mission, burn down fuel, and land.
c. Make a flyby down the runway for the SOF to check the aircraft.
d. Abort the mission and land immediately.

What the Crew Did

Since there was no obvious damage, the crew chose option a and continued the mission. They had no problems during the flight. However, when they returned, they were informed the aircraft had lost the third stage of the afterburner liner.

The crew was lucky in this case. A better course of action would have been option b or b and c combined. They never should have ignored the noise they heard, especially since they received a report of something falling from the aircraft.

Play it safe. Don't invite trouble by ignoring indications of a potential problem. You might not be as lucky as this crew. ■

Send your real-life submissions to:
What Would You Do?, *Flying Safety* magazine,
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UNITED STATES AIR FORCE

Well Done Award

Presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Mishap Prevention Program.

CAPTAIN
Edward E. Neves

CAPTAIN
Charles G. Sherlin

715th Bombardment Squadron
Pease AFB, New Hampshire

■ On Friday, 13 March 1987, Captain Neves, aircraft commander, and Captain Sherlin, radar navigator, were flying a high altitude, supersonic sortie in an FB-111A. The takeoff weather had deteriorated to 600 broken with a runway visibility of 3,800 feet and instrument conditions extending up to approximately 32,000 feet MSL.

After entering the designated airspace at FL 350, Captain Neves accelerated while sweeping the wings aft and continuing a gradual climb. At FL 360 and mach 1.4, the attitude caution light illuminated. A quick cross-check showed the standby attitude indicator was unreliable.

Approximately 5 seconds later, the crew heard a loud bang as the right engine compressor stalled. The aircraft yawed to the right and began to lose altitude rapidly. Captain Neves immediately applied corrective control inputs and declared an emergency as Captain Sherlin ran the engine stall checklist.

Initial crew actions to clear the stall were unsuccessful, so they decided to shut down the stalled engine and attempt a restart. Captain Neves brought the aircraft around to a vector for Pease AFB as Captain Sherlin directed airstart procedures. As Captain Neves rolled the aircraft out of the turn, the remaining attitude indicator failed, leaving the crew with no attitude reference.

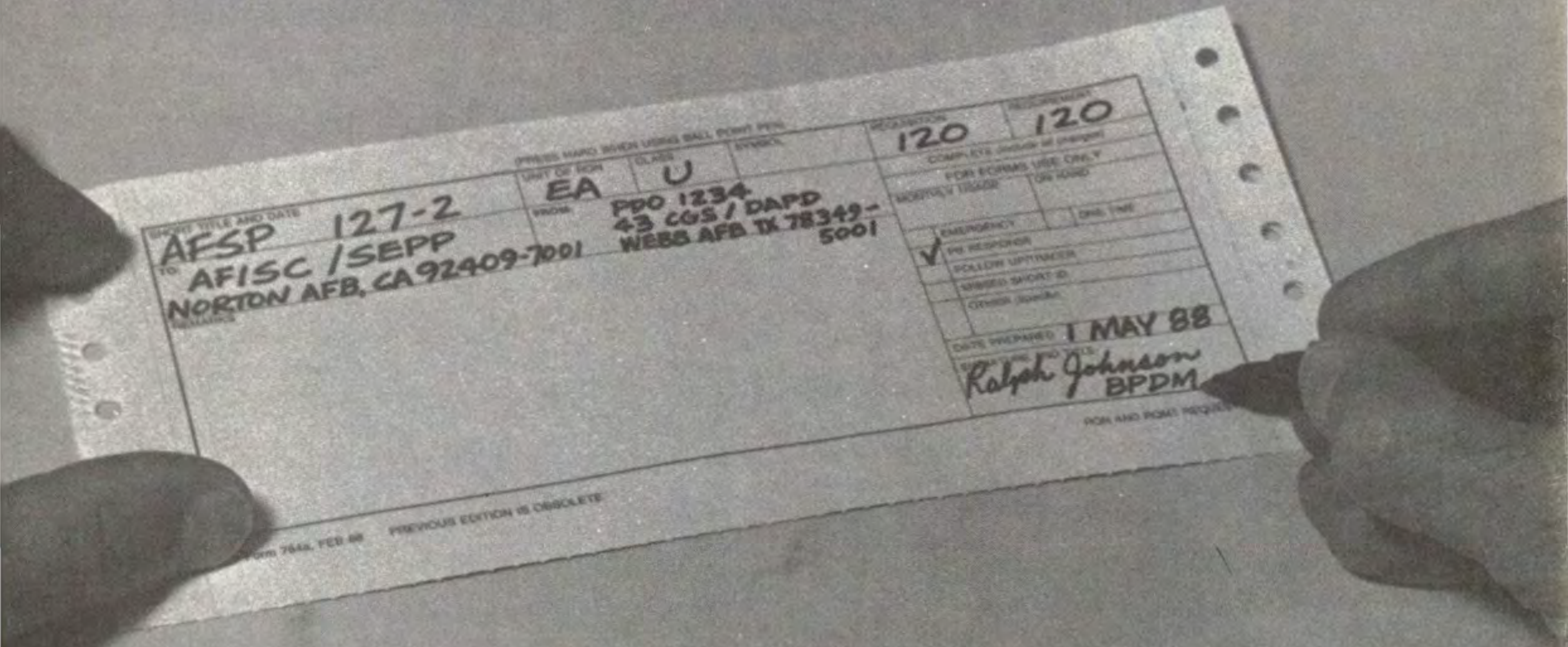
While Captain Neves skillfully performed a needle-ball-airspeed recovery in IMC, Captain Sherlin confirmed a successful restart on the right engine. Captain Neves continued the descent to visual conditions using needle-ball-airspeed and proceeded to the base with no-gyro vectors due to the low visibility conditions. He then flew a flawless no-gyro GCA to a successful landing.

Captain Neves' quick reactions and flawless airmanship, along with Captain Sherlin's indepth knowledge of emergency procedures prevented the possible loss of a valuable Air Force aircraft and crew. WELL DONE! ■

FLYING SAFETY IS . . .

ALIVE AND WELL

You may have noticed in AFR O-2, Numerical Index of Standard and Recurring Air Force Publications, dated 1 April 1988, that AFRP 127-2 has been rescinded. That is true, but *Flying Safety* is still being published. However, it has been changed from a recurring publication (AFRP 127-2) to a specialized publication (AFSP 127-2). Specialized publications are not listed in the O-2, so you won't find it there. *Flying Safety* is now governed by AFR 8-21, Air Force Education and Training Documents for Mishap Prevention, dated 29 February 1988.



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