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Heat
(Summer Ops & Deployed Ops)

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contents

Front Cover: U.S. Air Force photo by SrA. Garrett Hothan

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U.S. AIR FORCE

Another summer is rapidly approaching, and we need to start thinking again about how to cope with those 100-degree-plus days. Walking out to the aircraft and getting strapped in will become almost the toughest phase of the mission. The ramp under the aircraft will amp up the temperature at least another 20 degrees, and you'll be soaked with sweat by the time you take off. Plus, since I don't foresee any air-conditioned limousines taking you out to your aircraft any time in the near future, learning to deal with the heat is critical.

This edition of ***Flying Safety Magazine*** has several good articles on coping with the summer heat and several heat-injury signs to watch for. If you're a supervisor, ensure your Airmen are educated in recognizing heat stress and heat stroke and know what actions to take. Most bases have heat index procedures to follow when the temperatures start to rise, and every Airman should know what the procedures are to ensure their own safety. The other significant summer hazard as a result of heat is thunderstorms. Lightning and hail can cause significant damage to aircraft, aircrew, and support personnel. Ensure you and your troops are educated and take the necessary precautions.

As you conduct your operations in the heat, be extra aware of those around you. We have a great bunch of Airmen out there who are mission hackers. They'll ignore the heat to the state of physical detriment to put an aircraft in the air on time. It's your job as a good wingman to take care of them. The heat of summer can be very trying out on the ramp, so let's ensure our Airmen are educated on the hazards and know what to do about them. Fly safe!

— The Safety Sage

DEPARTMENT OF THE AIR FORCE — THE CHIEF OF SAFETY, USAF

PURPOSE — ***Flying Safety*** is published monthly to promote aircraft mishap prevention. Facts, testimony, and conclusions of aircraft mishaps printed herein may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. The contents of this magazine are not directive and should not be construed as instructions, technical orders, or directives unless so stated. **SUBSCRIPTIONS** — For sale by the Superintendent of Documents, PO Box 371954, Pittsburgh PA 15250-7954. **REPRINTS** — Air Force organizations may reprint articles from ***Flying Safety*** without further authorization. Non-Air Force organizations must advise the Managing Editor of the intended use of the material prior to reprinting. Such action will ensure complete accuracy of material amended in light of most recent developments.

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HQ AFSC Photo by Andi Blackwell
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BASH Campaign

The Safety Center is embarking on a BASH Awareness Campaign this year. Significant progress is being attained on several different AF-level BASH-related programs, culminating years of research, coordination, and staffing efforts. As spring bird migration progresses northward, I urge you to take the opportunity to re-educate your wings on the significance BASH has upon your mission. Please take time to review your BASH programs, from installation environmental management to operational flight procedures, including risk management.

Bird/wildlife Aircraft Strike Hazard mishap events pose a credible threat to aircrew safety and mission sustainment. Thirty-five USAF aviators have died as a direct result of bird strikes since statistics were collected on this subject. After normalizing BASH data, USAF aircraft sustain an average of $19 million in damage annually due to wildlife strikes. On average, 3,300 wildlife strikes are reported each year. Nearly 50 percent of those strikes occurred on or around the immediate airfield environment and accounted for 32 percent of total mishap damages. More telling, only 15 percent of all strikes occurred in the low-level and range mission flight environments, but accounted for 62 percent of damage costs. Statistical and scientific analysis indicates flying above 3,000 feet AGL reduces strike potential by 94 percent.

BASH strike trends increased dramatically in calendar year 2007. Our fleet sustained $21 million in damage due solely to wildlife strikes, with cost increases expected as investigations close out. The Air Force also experienced a significant increase in damaging strikes last year. There were four Class A and 14 Class B BASH-related mishaps in 2007, compared to the 22-year annual average of 1.6 Class A and 5.7 Class B events. The number of reported wildlife strikes has increased over the last five years, with 4,500 recorded last year. Better program management and awareness, as well as increased bird populations, are components of these statistics.

Lessons learned highlight unity of effort between

agencies within your wing and supervisor knowledge is paramount to a successful BASH program. Cross-functional participation and concurrence is essential among your Safety, Civil Engineer, Judge Advocate General, Public Affairs, Director of Operations, and Logistics staffs to safely execute your mission. Each organization plays a vital role in reducing exposure to this risk. Now is the time to exploit all the available tools to mitigate damage, to save lives, and to preserve mission capability. The Bird Avoidance Model and Avian Hazard Advisory System were designed to mitigate threats in low-altitude flight environments and have evolved to provide additional wildlife forecasting around airfields as well. Success relies on a thorough understanding by all involved of the tools used to reduce BASH impacts on flight operations. AHAS is being revised to provide more detailed information, allowing leadership and users to exploit good ORM practices when executing flight operations. A comprehensive training guide will be available on the AHAS Web site when the revision is complete.

Look to the Air Force Safety Center for BASH reach-back capabilities. Visit our BASH Web site at *http://afsafety.af.mil/sef/bash/sefw_home.shtml* for additional information, from safe remains collection procedures and program development, to species specific prevention and control techniques. My BASH team supports wildlife-related mishap investigations, assists with operational wildlife control, habitat management, and coordination with outside agencies. They are also my POCs for the BAM/AHAS and Feather Identification Programs. The BASH Team can be reached at *afsc.sefw@kirtland.af.mil*.

We can ill afford to have weak BASH programs in these tight budgetary times. We in the safety community believe the BASH Campaign, if properly implemented, could potentially yield huge AFSO 21 benefits. Thorough evaluation of your BASH program will enable your team to focus their research, and to develop and enhance programs that will effectively and efficiently target and mitigate your hazards. My BASH Team professionals stand ready to assist you in any way necessary. I invite you to contact them for personalized trend analyses and on-the-spot technical advice. Please consider inviting them to your location for a tailored staff assistance visit. Mr. Eugene LeBoeuf is the USAF BASH Team Chief and can be reached at DSN 246-5679. ★★

U.S. Air Force photo by A1C. Christopher L. Ingersoll

"On average, 3,300 wildlife strikes are reported each year. Nearly 50 percent of those strikes occurred on or around the immediate airfield environment and accounted for 32 percent of total mishap damages."

Maj. Gen. Wendell L. Griffin, USAF

Heat Injuries

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Whether you're deployed to the Middle East or conducting operations during the heat of the summer, many military operations are conducted under extremely hot conditions. Because of the insidious nature of heat illnesses, heat injuries frequently result because individuals don't recognize their signs and symptoms until it's too late.

Sweat is our body's protective cooling mechanism against heat injury. As long as we can sweat and the sweat can evaporate, we can continue to cool ourselves efficiently. If either the sweating mechanism begins to fail or the sweat cannot evaporate, then the cooling mechanism will fail and heat injuries may occur.

On hot, humid days, our cooling mechanism is extremely inefficient, and it becomes relatively easy to overheat because the sweat cannot evaporate. The evaporation of sweat from skin accounts for 90 percent of our cooling ability. Additionally, our ability to sweat diminishes as we become dehydrated.

There are numerous ways we lose body fluids every day. Sources of fluid loss include respiration, perspiration, urination and defecation. The rate of loss from each of these will vary according to activity levels, air temperature, humidity and altitude. With normal daily activities, we typically lose about 1-2 liters just from respiration and another 1-2 liters from normal perspiration. We can lose 8-10 liters during exercise or heavy activity. A 150 pound person can lose 2 percent of their body weight in fluid (three pounds) in just one hour! Because muscles are made up of approximately 70 percent water, this can definitely affect our ability to continue to do both aerobic and anaerobic work.

How much fluid do you need? One of the best ways

to judge hydration status is to check the color of your urine: it should be relatively odorless and no darker than the color of straw. The rule of thumb is clear fluids in, clear fluids out. Once an individual becomes dehydrated, they're more susceptible to developing a heat-related illness. Early symptoms of dehydration include feeling thirsty, fatigued, loss of appetite, lightheadedness and flushed skin. Later symptoms include difficulty swallowing, stumbling, numbness, blurred vision, painful urination, muscle spasms and delirium. It's extremely important to pay attention to these early symptoms so that heat illnesses can be averted. If it continues and goes untreated, heat exhaustion and heatstroke may occur.

Heat exhaustion is a condition caused by water and electrolyte loss. The primary cause of symptoms is related to the amount of sodium chloride (salt) lost. Symptoms can include excessive thirst, fatigue, exhaustion, nausea, muscle cramps, anxiety, agitation and headache. If treatment is further delayed, heatstroke may result. Heatstroke is a potentially life-threatening situation. Death can occur in less than 30 minutes. As the brain overheats, the individual may become disoriented, combative, argumentative and hallucinate. Symptoms may also include seizures, vomiting and coma.

We assume that our thirst mechanism will protect us from dehydration. This is not always the case. Our thirst sensation doesn't normally kick in until we are already 2 percent dehydrated! Don't wait until you're thirsty to drink; it may be too late at that point. Instead, design a fluid plan, just like you plan what you'll be eating that day. Drink a couple glasses of water with breakfast and throughout the morning, a couple at lunch, again mid-afternoon, and then some more at dinner. A good rule of thumb is that you should consume a minimum of 72 ounces of fluid every day. Obviously, if you're going to be exercising or working outdoors and sweating a great deal, you'll require more fluid than this basic recommendation. The type of fluid is not nearly as important as the overall quantity, although water should be your primary fluid of choice. Alcohol and caffeinated beverages are both diuretics, which can increase your fluid loss.

U.S. Air Force photos by MSgt. Debbie Aragon

There are things you can do to protect yourself from heat injuries. Stay well-hydrated by drinking plenty of fluids 12 hours before a scheduled work/exercise period. Our bodies can lose up to 2½ quarts per hour, but can only absorb about one quart of water per hour. Carrying a clean, reusable water bottle can also be beneficial while at work, especially if you typically spend time outdoors. Pay attention to work/rest cycles and take frequent breaks from the outdoor heat. If possible, wear clothing that allows for evaporation to help with the cooling process. As a supervisor, pay close attention to where your people are and what they're doing. Everyone should be able to recognize the early signs and symptoms of heat illness so that further heat illness progression can be avoided.

Can you drink too much water? The answer is yes. Perhaps you have heard of "water intoxication" incidents with U.S. military recruits and athletes at summer training camps. The military has traditionally focused on the dangers associated with heat illness, which have killed a number of healthy, young enlistees. However, pushing the need to drink water too far can also have deadly consequences. Unfortunately, the dangers of over hydration are similar to those of dehydration! Over hydration can flush out critical electrolytes like sodium and potassium. Look for sweating, dizziness, fainting, flushed skin and possible unconsciousness. When we drink too much water, brain swelling can result. To prevent over hydration, stay hydrated, but limit your water intake to one quart per hour, and 12 quarts total per day. If you suspect over hydration, call 911, as this is a medical emergency!

Here are two examples of heat injuries:

- A 19-year-old Air Force recruit collapsed during a 5.8-mile walk, with a body temperature of 108 degrees Fahrenheit. Doctors concluded he died of heatstroke and low blood sodium levels as a result of over hydration.

- A 20-year-old trainee in the Army drank around 12 quarts of water during a two- to four-hour period while trying to produce a urine specimen for a drug test. She experienced fecal incontinence, became confused, lost consciousness, and died from swelling in her brain and lungs.

Heat injuries are preventable. Continually check each other to ensure no one succumbs to a heat-related illness, especially when conducting military operations under extremely hot conditions.

Lightning Strikes Again

U.S. Air Force photo by TSgt. Scott Laforest

ANONYMOUS

Every year we face threatening skies, especially during the summer, regardless of location. Yet we still try to push the limits when lightning is close by or overhead. We think the odds are too high to get struck by lightning, and we say, "It won't happen to me." We think we have a magic shield, regardless of whether we're in the air or on the ground. The magic shield doesn't exist, and people and planes get struck. Lightning is the second-deadliest weather-related killer in the United States, averaging 73 deaths per year. In addition, hundreds more are injured, many with serious and lasting effects on their quality of life.

Lightning awareness is more important than ever as the severity of the weather increases with each year. At any time, more than 2,000 thunderstorms throughout the world produce 100 flashes of lightning per second. With technology and media channels, the information is there, but how many of us ignore the warnings or think it's too far away to affect us? We go out to play a round of golf and soon realize the storms are not that far away, and as we tee off on number five, lightning hits within a hundred yards. Then we're wishing we hadn't ignored the warnings as we say to ourselves, "That was too close!" That happens more often than not, and there may not be a next time. Regardless, we still decide to push the limits.

When jets get struck by lightning, the end result is usually not fatal, but sometimes causes significant damage. How many times have people decided to push the limits in the air when it comes to thunderstorms? I recently observed commercial airliners being vectored to final under a well-developed thunderstorm three miles from the threshold. It seemed like a miracle to watch five jets make successful landings without getting struck. Not minutes after, several airliners had to go-around due to serious wind shear, and I wondered if they saw it coming. Some pilots have the "I-can-make-it" syndrome, but some of them don't make it and get struck by lightning. You have to ask yourself how important it is to push the limits and run the risk of damage to aircraft, or worse, getting into a situation you can't get out of.

Lightning strikes are unpredictable. Being conservative is not a bad idea. Some say you can be too conservative, and finding that fine line between how close you push the limits to get the mission done versus knock-it-off early for weather, or decide on the dreaded divert. No one likes to divert unless it's to a better location than home station, and sometimes that, too, is painful, due to the logistics of getting the jet back home. Therefore, we try to push the limits getting back home and sometimes find ourselves in the middle of a serious mess. Possible scenario: you find yourself in the middle of embedded thunderstorms, your jet gets struck by lightning, and you lose total electrics. You find yourself flying through the weather without any navigation capability. You're looking for your wingman to lead you back home, or as a singleton, you're hoping for VMC. After finally getting the jet on the ground, you end up asking yourself, "How important was it to push the limits today?"

Several tools are available to provide more situational awareness on thunderstorms and lightning during preflight planning. These tools can also be used by your flying supervisors to give real-time data while in flight, and are available at many

bases for your cross-countries. The technology available today is far ahead of what was used just a few years ago for lightning strikes. Most preflight planning areas provide a link to real-time data on lightning strikes and give exact mileage from the airfield. These links give important lightning trend information, as well. By reviewing this information, you can see the intensity of the storm and how quickly it's building or dissipating. This data will let you have a "going in" game plan on how to navigate to and from the field. The few minutes it takes to look at lightning information/trends could save you from the dreaded lightning strike and possibly many more problems to follow. This lightning data can also be used for good situational awareness on your recreational plans when it comes to deciding whether to play that round of golf or go through the trouble of getting your boat in the water and later realizing lightning is hitting close by. With most lightning-strike fatalities involving people on the ground, it's not a bad idea to get some SA on the developing weather and to make sound decisions on avoiding lightning.

Lightning is a threat to everyone when it comes to flying and ground activities. Most of us have heard of or have had a personal experience with lightning strikes. Many of these stories include near loss of life or actually taking a life. Taking a few minutes before any outdoor activity to preview the weather and determine if lightning is a threat to your plans could pay big dividends. It's important that we pay attention to the information out there, whether it's preflight planning or getting ready for a round of golf. Doing so may just save you from serious damage, or even save your life.

Selection of Web sites for lightning safety and live lightning data:

www.lightningstorm.com
www.lightningsafety.noaa.gov
www.weathertap.com (requires subscription)

U.S. Air Force photo by SrA. James Croxon

Traffic, Traffic

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I had been flying the KC-135 for almost five years before the "Shock and Awe" start of Operation Iraqi Freedom; more than three of those years were flying TCAS-equipped aircraft. I'd heard TCAS resolution advisory warnings during countless preflight self-tests, and occasionally when we didn't make the switch to "TA only" quick enough for the Prep-for-Contact checklist, with a receiver closing on us for refueling. However, until March 2003, I was lucky enough to have never had a real TCAS RA. In the month that followed, I experienced three.

My first RA occurred at night. I was flying with a fairly experienced crew, and we were finishing the Post Air Refueling check as we left our orbit. We were in the first turn on our routing home, and as we rolled out on course, we heard, "TRAFFIC, TRAFFIC." We looked outside, but initially couldn't see anyone out there. Shortly thereafter, we heard, "CLIMB, CLIMB," and TCAS displayed a "+00" symbol on our MFDs, indicating co-altitude traffic, at our 2 o'clock, getting closer. Alarmed, we returned our attention outside, and this time saw the lighting of a small aircraft much closer than we liked. Following the commands of the life-saving magic box that is TCAS, we initiated a climb to the next available altitude and resolved the conflict without further incident. It was too dark to visually identify the other aircraft, and we were unable to make radio contact. To this day, I can't say for certain whether the other aircraft had been flying with its lights and transponder off until the crew saw us closing on them, or if their equipment was on the entire time, and we just failed somehow to notice earlier.

It was the second RA that really scared me. We were about 20 minutes inside the Iraqi border, at night, on our way back to base after completing our assigned mission. As countryside passed beneath us in the darkness, we began to notice an acrid smell in the cockpit. I instructed the crew to go on oxygen, and we began to troubleshoot. Previous times I'd smelled this kind of odor in the KC-135 was caused by an air cycle machine that shelled out in flight. This time it wasn't accompanied by the usual signs of a bad ACM, such as smoke coming from the air vents or a rumbling in the floor at the cargo door. As a result, I was concerned that we

U.S. Air Force photo by A1C. Christopher Griffin

might have a fried piece of electrical equipment or possibly an electrical fire. We were still a long way from "home," with no other suitable airfields nearby, so I pushed it up to near-barber pole as we continued to troubleshoot. Once we crossed the border, we ran through our fence check and then got back to the fumes, which we still hadn't been able to isolate. The Electrical Fire Isolation checklist is fairly lengthy and calls for shutting down all generators and running on battery power while troubleshooting. The smell hadn't gotten better or worse. Given the number of other aircraft around, and that there had already been aircraft lost to friendly fire, I was extremely hesitant to take my generators offline without definite indications of an actual fire. That would have severely limited my ability to aviate, navigate, communicate and be seen by others, so we continued trying to isolate the source by other means. We were between two reporting points in a place where, according to our airspace information, no one should have been entering or departing the driveway. We made the required radio calls, but due to the troubleshooting, I allowed my attention to become focused largely on what was going on inside our jet.

As unnerving as a potential electrical fire was at night in a combat zone, I soon discovered that I needed to dedicate at least one more brain cell to what was going on outside. A "TRAFFIC, TRAFFIC" advisory from TCAS brought me around, and when I looked outside, I saw a very large aircraft at our 11 o'clock, turning right in front of us to join the driveway, apparently oblivious to our presence. In the darkness, it took me a few seconds to realize that the aircraft was co-altitude and closing. When TCAS commanded, "DESCEND, DESCEND" a moment later, I complied immediately. Our two aircraft got well within a half mile of each other. With a closure speed of more than 400 knots, we were once again seconds away from a very bad day. For whatever reason, we never heard the other aircraft on the radio before or after, and my efforts to contact the crew directly and through the controller were unsuccessful. We continued our RTB, declared an emergency for the fumes, and landed without further incident.

The third RA happened in daylight as we returned from a mission within a few miles of the field. We were even more dependent than usual on ATC for traffic deconfliction, because departing and arriving aircraft passed over the same point. Approach cleared us to descend and switched us to tower. We had just initiated a rapid descending turn when we spotted opposite direction traffic nearly co-altitude below us in a turning climb. About the same time, TCAS piped up with a "MONITOR VERTICAL SPEED" warning. With nearly 500 knots of closure, our two crews were only seconds away from merging to form the U.S. Air Force's first eight-engine tanker. Given the short test-pilot careers that would have followed, we instead chose to level off and tighten up our turns. We didn't get close enough to see if the pilot on the other jet still had spinach in his teeth from lunch, but I can tell you that he was wearing sunglasses. When approach handed us off to tower, they gave us no warning of a potential conflict. Almost simultaneously, the other aircraft was switched from tower to approach control without being notified of our

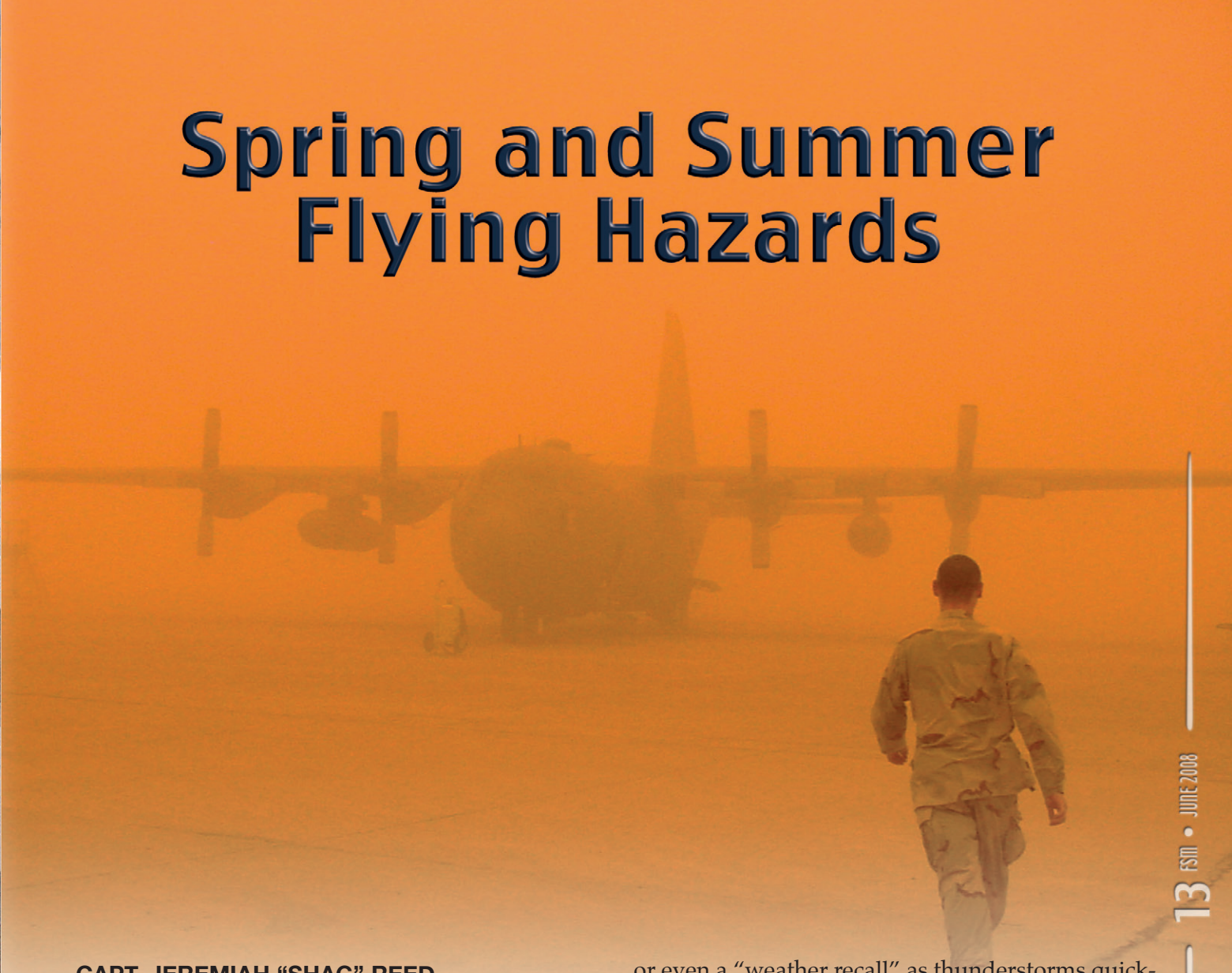
U.S. Air Force photo by SSgt. Joshua Strang

proximity to them. Because of the timing of the frequency changes, we never heard each other on the radios.

The volume of air traffic crammed into the limited airspace available at the outset of OIF forced us to accept conditions that would have been totally unacceptable under normal circumstances, including times when air traffic control was limited, if not totally unavailable. During the second incident, running into another aircraft in the congested, chaotic airspace would have killed me just as surely as the possible electrical fire we were trying to locate. In situations such as these, especially at the start of an operation when everyone is still at the bottom of the learning curve, increased vigilance and aircraft safety systems, such as TCAS, may be all that stands between you and a sizeable SGLI payout to your loved ones.

U.S. Air Force photo by MSgt. Bob Wickley

Spring and Summer Flying Hazards



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Now that summer is fast approaching, so are the hazards of warm-weather flying. Weather factors, including pop-up thunderstorms and high-density altitudes, bring hazards such as lightning, hail, wind shear, microbursts and decreased takeoff and landing performance. Seasonal bird activity can ruin your day on low levels and in the pattern, and the effects of hot weather can degrade performance in the cockpit. If that's not enough to worry about, fair-weather day civilian flyers, including bug-smashers, gliders, hot air balloons, ultralights, parasailers and sky divers, can add unexpected threats to your mission. Air Force aviators must plan for these considerations before stepping from the ops desk. In the following paragraphs, I'll cover the risks involved with summer flying and how to mitigate them.

Spring and summer weather can be unpredictable. Missions launching with planned VFR recovery fuels can quickly turn into "alternate required" or even a "weather recall" as thunderstorms quickly build. Hearing that your four-ship is No. 6 in line for recovery in unexpected weather with VFR recovery fuel is enough to make any pilot suck cushion. Always have a weather backup plan, even for a "clear and a million" day. I'm not saying fly up initial with alternate fuel, but getting a weather check with the SOF before reaching preplanned alternate joker would be wise on a day when the weather shop is predicting storms, whether or not it's clear in your present airspace. Flight members should also back up each other on that guard call for alternate fuel or a weather recall, ensuring everyone acknowledges the new plan.

Conditions may be so bad that you divert anyway. Lightning from a thunderstorm can travel more than 20 miles from the storm, and the hail produced by one of those towering innocent-looking puffies or menacing anvils can travel well above and outside the cloud. It also pays to be vigilant about wind patterns associated with such storms. Wind shear can slam you into the ground short of the runway when you're nearest stall speed and disadvantaged in maneuvering speed

U.S. Air Force photo by SSgt. Jason Serrit

and altitude. Microbursts can be present even without a full-blown storm and have killed many aviators. Signs of them are a large dispersal of dust on the ground in a circular pattern, as well as virga below a cloud. Storms are sometimes embedded in other clouds. Even if you don't have weather radar, if your aircraft is equipped with air-ground radar, learn how to use it to search for and avoid thunderstorms en route.

Icing in clouds can also be a factor if you're high enough. Listen for and request PIREPS from ATC for flights ahead of yours, realizing the information can be highly perishable over a short time. Pass PIREPS along for aircrew trailing your flight. Sometimes the best short-term weather predictor is your own Mark I set of eyeballs. Assess the risks before pressing home. It's better to suffer the inconvenience of a divert than to wreck an airplane, or even worse, lose a life.

Scorching days can cause problems with aircraft, as well as human performance. Hot, humid days may drive the density altitude to a point where it's unsafe to depart. Runway abort distance or loss of an engine may be factors; also, check those climb gradients listed on the departure procedure for your aircraft performance that day. Don't forget to check landing distance as well, since high-density altitude may cause higher ground speeds for the same indicated airspeeds, and hot brakes are more likely. Also, review hot-weather operating procedures for your aircraft; some -1 procedures or checklist items may change.

Equally important, ensure your body is prepared for the increased temperature. Stay hydrated by drinking plenty of water the day before and the day of the mission. You can't fully hydrate your body from a dehydrated state the morning of — it takes preparation from days before. Take water with you in the cockpit, and don't be afraid to call "Uncle" on the Gs that day, especially if flying multiple missions. Revert to a less-demanding mission, or even RTB that day if you have to. The jet will be there the next day. Assess everyone's physiological condition in the brief, and remember that only 3 percent dehydration causes a 50 percent reduction in G tolerance!

Birds are another potential hazard, especially at lower altitudes. Birds tend to be attracted by water and grain crops, but can be anywhere. Think how many times you've flown in the pattern and seen that dark blotch of feathers flash by the canopy at the last instant, with no time to react if you needed to. That's incentive to always keep your visor down and mask up below 10,000 feet for protection. Don't think birds only fly low altitude; there have been plenty of bird strikes above 10,000 feet — the record highest at 37,500 feet! Be sure to check local BASH and bird avoidance information before takeoff, and listen up on ATIS on the way back to the pattern. Plan low-levels to avoid known areas

U.S. Air Force photo

of high-seasonal bird activity and be aware near bodies of water and open fields. Avoid flying within an hour of sunrise or sunset. If you do encounter a known bird strike airborne, RTB immediately and be extra vigilant in the cockpit. You never know if his wingman went down your engine intake, causing an impending catastrophic failure. Once on the ground, notify your local safety office and have the remains sent for analysis to keep track of local migration patterns.

Finally, while you're training to fly, fight and win, many others are flying purely for recreation and enjoyment. Few civilian recreational flyers have a full understanding of military flying operations. Think back to before pilot training when you had your private pilot's license, in a Cessna 150, alone and unafraid, with 40 hours total flying time under your belt. How much knowledge did you have of military aircraft training areas or routes? Did you actively avoid MOAs and low-level training routes marked on your sectional? Were you on the lookout for a 400-knot F-16 or invisible nose-on T-38 to go screaming by on a low-level, and if you were, did you think to look out for the wingmen, as well? That should put into perspective that, as a military aviator, you can't be vigilant enough when you're operating in areas of civilian traffic at four times the speed of a typical bug-smasher. Religiously check the NOTAMs for all airfields along your route; you never know when sky diving, glider or other increased operations may affect a portion of your route. Adhere to standard IFR or VFR cruising altitudes. When flying VFR, always use flight-following, realizing that you can't afford to rely on ATC completely. Many civilian VFR aircraft aren't communicating with any ATC agency and have no transponder, which leaves the onus on you to see and avoid.

The prevailing sunny days of summer don't necessarily translate into more favorable flying conditions. The risks can be just as high, if not higher, than in winter, especially since many of the aforementioned hazards can be unexpectedly compounded to create the "perfect storm" for a mishap. Remember that any mishap could have been prevented with a change in single link in the mishap chain; there are always opportunities to intercede in the mishap sequence. All it takes is an awareness of risks involved and making sound, disciplined decisions to properly manage those risks. It's imperative to apply basic ORM principles to every mission. Know yourself, know your aircraft, and know and plan for environmental changes.

Summertime brings many seasonal challenges to the flying environment. The weather changes rapidly and the sky tends to be more populated with birds and civilian aircraft. Take a little extra time in your planning, hydrate well, and be a little more vigilant in the "see and avoid" environment.

U.S. Air Force photo by TSgt. Jeffery Allen


Feel the Heat

U.S. Air Force photo by TSgt. Scott Reed

Deployed $afety, But At What Cost?

Photo by Darren Reehl

ANONYMOUS

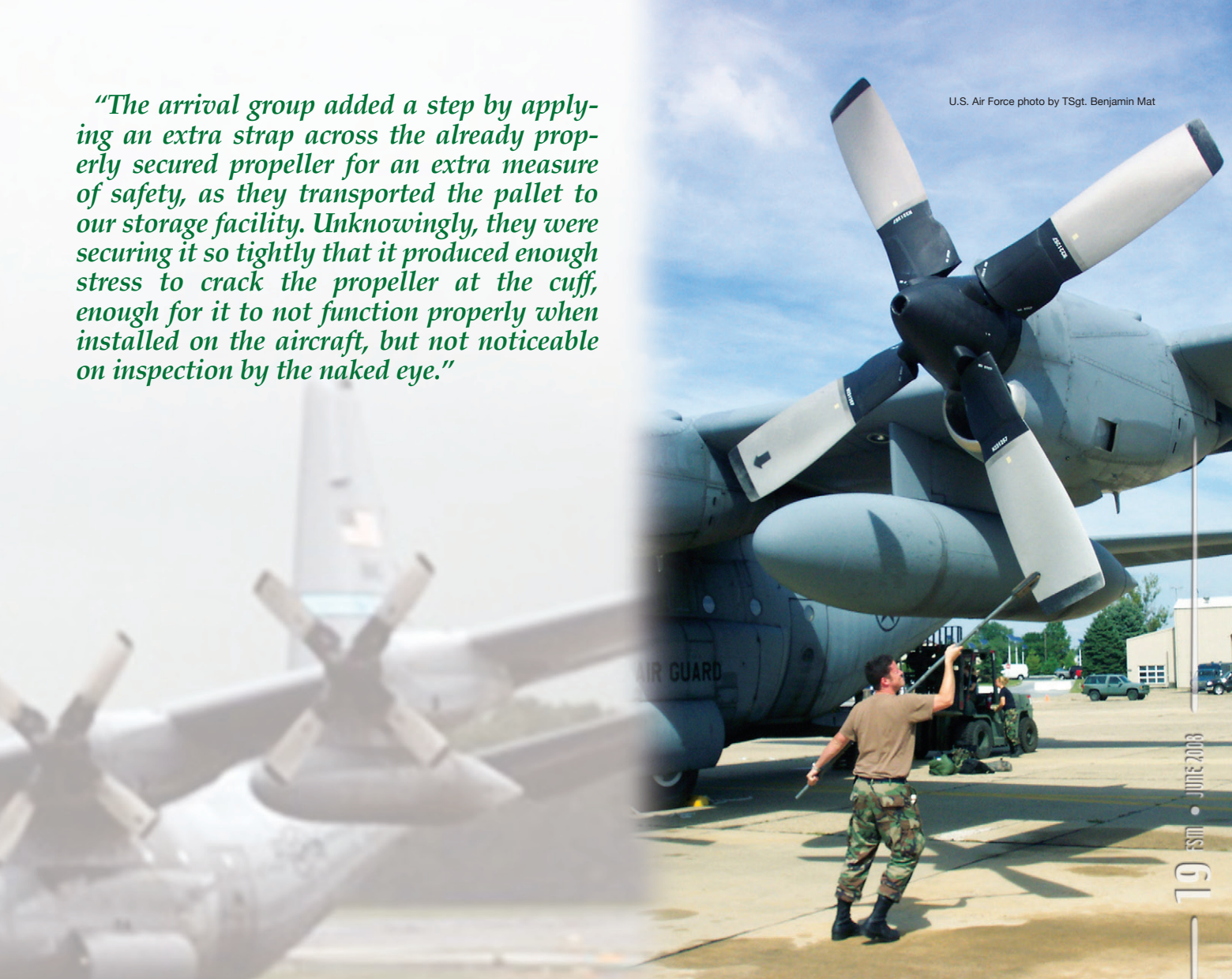
I recently returned from a deployed location where I learned a very valuable, but more importantly, expensive lesson about safety. Safety should be a high priority on all of our lists, but at what point have we gone too far? Isn't it reasonable that the benefit should outweigh the risk, mission dictating? When do we draw the line, and then, where do we draw it? Have we examined our joint operations for functionality, especially when involving civilian contractors operating in our deployed locations? Does this process need to be readdressed?

Airplanes are our business, so we make it our business to keep them mission-capable at all times, or at least as much as possible. On a recent deployment, my unit learned the hard way that the extra safety precautions can cost a fortune, not only in money, but also man-hours and lost sorties. Aircraft parts, whether coming from the CONUS or a depot in the AOR, have certain regulations governing how they're to be secured on pallets, especially large parts, to prevent possible damage. This important fact was unknown to the arrival control group at our deployed location. It would play an important part in our upcoming woes and could have adversely affected our mission capability.

We changed the propeller on the No. 2 engine, with minimal loss of mission capability, or so we thought. After the change, the aircraft was scheduled for a sortie the following morning, only to return to the chocks after having to shut down the No. 2 engine on the runway. We were perplexed. Didn't we just change that prop? After tearing down the propeller, maintenance discovered a crack at the cuff of the prop. So the prop was changed once again, and the problem supposedly fixed. Missions were planned, crews were put into crew rest, the aircraft was fueled and serviced, and we were ready to re-attack the sortie, only to be met with the same fate again without a clue as to what was going on with these propellers. It's important that we have a full force of functioning airplanes for our alert status. These setbacks were frustrating both operators and maintainers, because they were beginning to affect our mission.

We had to figure out the problem, and no one was more determined than our maintenance OIC

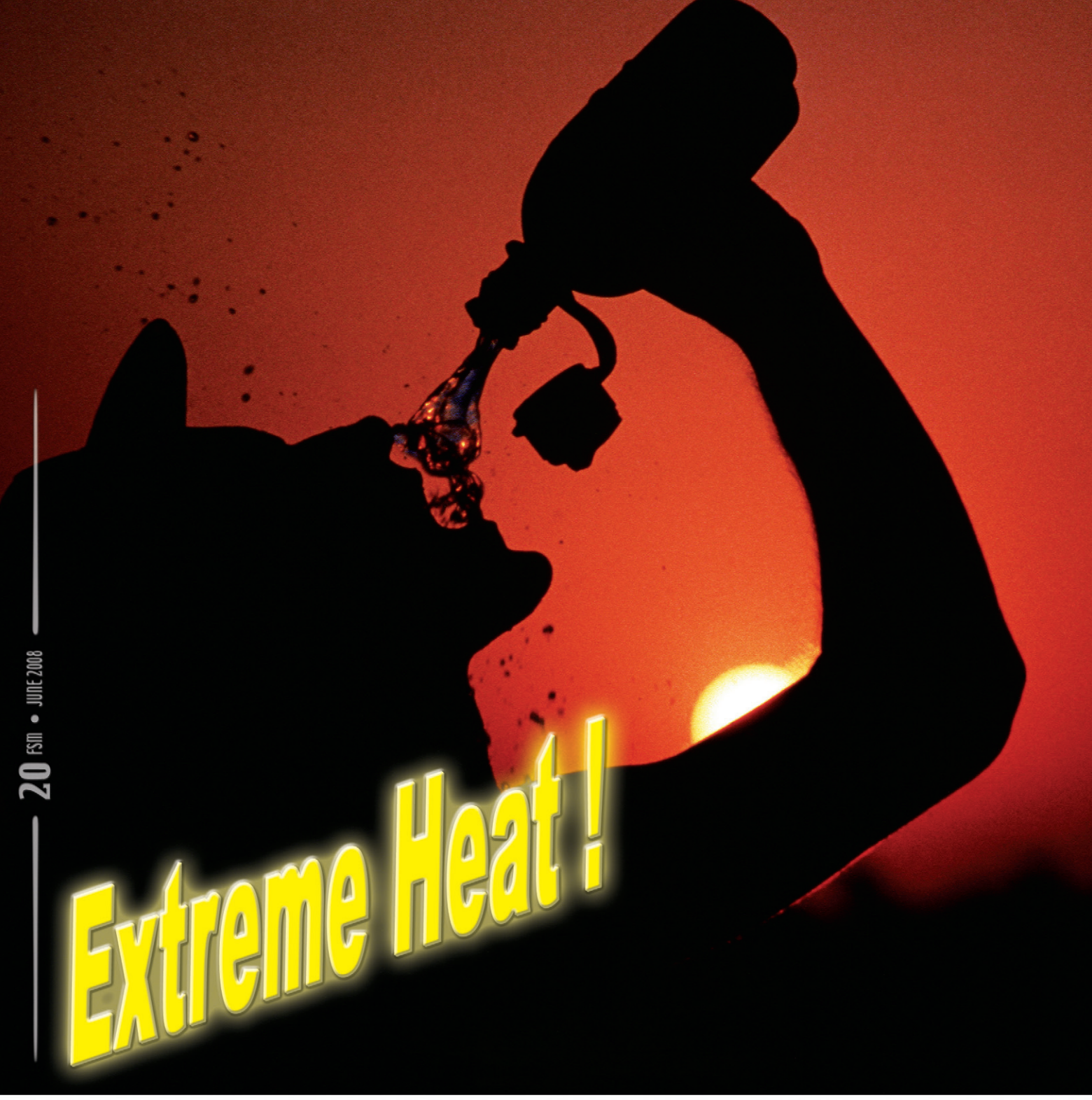
"The arrival group added a step by applying an extra strap across the already properly secured propeller for an extra measure of safety, as they transported the pallet to our storage facility. Unknowingly, they were securing it so tightly that it produced enough stress to crack the propeller at the cuff, enough for it to not function properly when installed on the aircraft, but not noticeable on inspection by the naked eye."



U.S. Air Force photo by TSgt. Benjamin Mat

and production supervisor. There was just no explanation as to why the props were cracked. After bringing in an MRT to repair the cracked props at a cost of more than $200K and countless man-hours, the maintenance crew began the tireless search for the origin of these props and, we hoped, our problem. Were the props coming to us with the cracks already present? Are we doing something incorrectly? All the tech data was being followed correctly by our maintainers in installing the prop, so we had no explanation. After four days of investigation, we determined that the props were being delivered to the AOR correctly, but were not making it to our parts storage house in one piece, a mere 50 feet away. What was happening? How could that happen in such a short transit time? The arrival group at our airfield would deplane and deliver the props to us with a forklift, because they were shipped on pallets. Seems like a normal operation, but the arrival group added a step by applying an extra strap across the already properly secured propeller for an extra measure of safety, as they transported the pallet to our storage facility. Unknowingly, they were securing it so tightly that it produced enough stress to crack the propeller at the cuff, enough for it to not function properly when installed on the aircraft, but not noticeable on inspection by the naked eye. What a difference one simple step can make on our mission-ready status.

Two new propellers and a week later, they finally had it figured out, but at what cost to the mission? Our alert status was in jeopardy, not just once, but twice. Could this have cost someone's life? In this low-density, high-demand weapons system, we cannot afford incidents like that. Are our rigging regulations not sufficient enough? Was it necessary to apply an additional securing device? Was safety stressed too much in this case? The problem has been resolved since that incident, and I hope it won't be an issue in the future, but is this a problem in other areas? Has this happened unknowingly in the past? Perhaps we'll never know the answers to these questions, but it certainly deserves an examination to ensure that we're all on the same page when it comes to how different organizations operate in concert in our deployed locations worldwide.



Extreme Heat !

CAPT. JAMES D. WENT
40TH Airlift Squadron
Dyess AFB, TX

On a recent deployment to Southwest Asia, aircrews dealt with a stifling heat wave as they attempted to complete their tasks. In some areas, the temperature climbed above 130 degrees Fahrenheit. Humidity added to the suffocating heat, and launching sorties became particularly difficult.

In a C-130 squadron, flight engineers and loadmasters working day-shift duty crew accomplished many pre-flights with the sun beating down on them. While aircrews readied themselves for potentially hazardous combat support missions in Operations Enduring Freedom and Iraqi Freedom, these duty crews spent the better part of a morning or afternoon inspecting and pre-flighting airplanes. Some eventually lost their individual battles with the summer heat and ended their day in a hospital bed.

Dehydration and other heat-related ailments

U.S. Air Force photos by SSgt. Scott Stewart

became a common occurrence. Aircrew members working duty crew or simply pre-flighting their own aircraft before takeoff experienced tremendous difficulty, and many ended up with more than one bag of fluid fed into their bodies intravenously after a trip to the base hospital. This problem severely degraded many squadrons' ability to complete their missions and limited commanders' options for selecting aircrews for each mission. More importantly, it caused people to become ill and suffer extreme pain and discomfort.

The problem is one without a simple solution. Aircrews, maintenance, and anyone exposed to the heat are instructed to drink plenty of water. Water is readily available in every tent and building. We know that our supervisors and commanders are proud of us when the mission is complete and everything gets done on time. Sometimes this leads to overexertion in the name of completing our tasks and completing that mission. Work-rest cycles are announced throughout the day, and air-conditioned tents are available for those trying to cool off after working diligently in the heat. But, when it comes right down to it, people need to take care of themselves.

During deployment, everyone's priority is to complete the mission. We all take pride in it and work toward that goal each day. It is the best and most rewarding part about being deployed, and we make sacrifices in order to reach our goals. Work-rest cycles are a nuisance. We hear them announced all day long, they clutter our e-mail in-boxes, and they are usually redundant. But, if adhered to, they will provide a measure of defense against heat-related ailments and prevent a trip to the hospital.

We all think we drink enough water, but do we really? Dehydration is difficult to predict. Sometimes we drink a lot of water during the downtime, when we spend half our days or nights in the chow hall, but then forget to continue drinking water during the workday. Other times, we become intensely focused on our work and refuse to stop to drink water until our task is complete. A few minutes of rest and shade in the middle of a pre-flight or maintenance detail can sometimes make all the difference. Drinking water and attempting to adhere to work-rest cycles are ways to help alleviate the problem, but I don't think they truly get at the source. When it comes to fighting the heat, our primary defense against dehydration and other ailments is our attitude.

If we step back and look at the big picture, our mentality may be a little different. Of course we want to contribute to the mission, and of course our supervisors and commanders are happy when we complete our tasks on time. But they are happier when no one gets hurt and all their people are healthy. It's much more difficult to get the job done when aircrew members are sick and support staff are injured. Accidents happen occasionally, and we all have to pitch in to make up for the temporary loss of a co-worker or fellow aircrew member. But heat-related illnesses are avoidable if we take the necessary precautions. Supervisors and commanders will accept a late takeoff or an airplane that requires extra time for maintenance if it means one less individual they have to visit in the hospital because of the heat.

Those who have suffered in the summer heat know that protecting themselves is easier said than done. An average summer day in the United States is much different from most in Southwest Asia; we don't typically see the thermometer top out at 130 degrees Fahrenheit. When that does happen, we have to be willing to cut back even further on our amount of continuous work, take more breaks, and put more effort into staying cool and being hydrated. Extreme temperatures can cause heat-related sickness quickly, and before you even recognize the symptoms, it may be too late. We can take actions, however, to minimize this risk.

It's also important to recognize the symptoms of any heat-related ailment. If you become dizzy or lightheaded or begin to experience muscle cramps or headaches, stop what you're doing and find a cool place to relax and hydrate yourself. Ask your flight surgeon, physician or other medical staff what to look for and how best to avoid succumbing to the heat. You can also learn more on Web sites, such as ***www.rehydrate.org*** or ***www.medicinenet.com***.

Extreme heat is one of the many hazards we face during deployments. Inevitably, there will be heat-related illnesses, but we can't allow this problem to reach its potential, becoming dangerous and deadly and causing permanent damage. Simple dehydration and sunburn can lead to more serious illnesses, such as heat exhaustion and heatstroke. If we work together and keep people informed, we can limit the amount of damage that high temperatures can do.

It's Your Decision

CAPT. MICHAEL ARMSTRONG
22ND Airlift Squadron
Travis AFB, CA

While deployed to the AOR a couple of summers ago, I was afforded the opportunity of going on a two-ship mission of C-21s around the Middle East and North Africa. It's not too often to get such a "good deal" while deployed, and being one of two IPs on the trip, I felt that it lay upon us to keep the mission going and get the planes back on time. This was particularly important since only three planes were deployed.

The mission started off uneventfully, and I didn't notice anything with either plane until the second day of the trip. What caught my crew's eye was a streak of hydraulic fluid on the tail of our plane. This is not an uncommon sight on the C-21 after having the hydraulic reservoir serviced, which it had been for our mission. Based on the size and location of the streak, we concurred that this was the most likely reason for the leak. During the preflight the next morning, the third day, the hydraulic leak appeared to be only residual fluid, reassuring us of our initial judgment, and we figured that little, if any, more fluid would be lost on subsequent legs.

"After parking and offloading our passengers, it was immediately apparent that the hydraulic leak was much worse than initially thought. A two-foot square puddle was on the ground, with a steady drip coming from the low point underneath the tail."

This all changed, however, after a short flight to Amman, Jordan. After parking and offloading our passengers, it was immediately apparent that the hydraulic leak was much worse than initially thought. A two-foot square puddle was on the ground, with a steady drip coming from the low point underneath the tail. This drew the attention of the other crew, and we all did our best to identify the source of the leak. None of us had any luck in doing so, but did notice the dripping slowed. This gave us hope that it might be the parking brake or some other system that might allow us to fly the plane back to base, our next scheduled leg, not causing a delay to the mission. We all decided we should call maintenance and see if this would be a possibility.

After describing the situation to the head of maintenance, he thought it would be a good idea to bring the plane back. I was a little apprehensive about that decision, since more than half an hour had passed of staring at the pool of hydraulic fluid under my plane. We agreed that my crew would start an engine, and then run several systems that require hydraulic pressure. We cycled the flaps, brakes and parking brake several times, having our third pilot and the other crew observe the leak as we ran through these trials. Nothing seemed to cause the leak to be any worse than the other; conversely, just adding pressure to the system caused the leak to return to a steady drip. All systems were functioning normally, and the hydraulic pressure was able to sustain normal limits. I passed that on to maintenance, and they suggested that the best action would be to bring the plane back, since all systems operated normally. Bringing the plane back would allow them to commit the other planes to missions the next day while fixing the leak.

I then called our deployed commander to fill him in on the details. After discussing the available

U.S. Air Force photo by SMSgt. David H. Lipp

options, our commander told us it was our decision on what to do, and that he would stand by that decision. The best option my crew came up with was to put all the duty passengers on the operational plane, and leave a crew with the plane, along with the Ravens we had brought along for security. This would allow us to finish the mission and not push our luck with the leaking plane. We also sent the crew on the operational plane back with photos of the leak.

With the help of the embassy, we found a place to park the plane for the night, along with rooms and transportation. They took great care of us, making it easier for us to secure the plane and set up a mission for the next day to bring out maintenance. When maintenance arrived, they were surprised at how much fluid had actually been lost. We serviced the hydraulic system, and an hour later, we pinpointed the source of the problem: a crimped line that supplied hydraulic fluid to the direct reading gauge in the cockpit. We severed the line completely and then capped it off to prevent further loss of fluid. The reservoir was again serviced, and we received a waiver to fly back without a working hydraulic gauge.

If we had decided to push forward and bring the plane back the day before, we would have put ourselves in the position of landing without enough hydraulic pressure on the plane to work our flaps, spoilers or normal brakes. Although we probably would have been able to stop on the runway without problems, there was a chance we could have blown a tire with our emergency brakes. Even if that didn't happen, we would have definitely shut down the runway while we were towed off. In hindsight, we made a good call not to take the plane and be put in the position to unnecessarily use emergency procedures.

"If we had decided to push forward and bring the plane back the day before, we would have put ourselves in the position of landing without enough hydraulic pressure on the plane to work our flaps, spoilers or normal brakes."

This was the first mission where I really had to make the decision to not go forward, without it being black and white. Since then, stan eval or maintenance has suggested bringing planes back, many times warranted, and just as many when they suggested staying and getting the problem fixed. **Bottom line:** the people in your organizations will always give you the best advice they can, but that's exactly what it is — advice. In the end, you're with the plane and have the ultimate say, and will sometimes have to go against their advice if you don't think the mission warrants the risk involved.

U.S. Air Force photo by TSgt. Justin D. Pyle

CRM vs Get-Home-Itis

ANONYMOUS

Department of Defense photo by TSgt. Jim Varhegyi

I was a midtime co-pilot on a C-130E crew, having a great time and enjoying life. I was on my second deployment in the venerable Herc, and my list of countries visited was starting to look like I was a member of the well-traveled rich and famous. OK, I was well-traveled due to the Herc, but I certainly wasn't part of the rich and famous. This was my second deployment with the squadron, and I had a fairly diverse crew, who I hadn't flown with much. Until then, I had a pretty good working relationship with all crew members. From the start of the deployment, I knew we had an all-star crew; we were going to have a ton of fun together over the next two months.

Things started off well. We lived together in our cozy little tent, minus our female navigator, and life in the tent was going well. Life in the plane was good, too. With six crew members on a plane for an extended period, we became very comfortable with one another, and very few topics were off limits in discussions on and off the plane.

Crew resource management is always an important issue to consider in a crew aircraft. If one person shows up for a flight not having a good day, it can totally throw off the entire crew's mojo and lead to problems that could have been avoided. As time went on for this crew, our interpersonal communications and interactions began to change for the worse. The fun-loving crew we had from the start began to break down. Crew members and even guest help noticed the overall attitude change.

I began to think back to advice from a well-respected NCO. He gave me his view on what a co-pilot's job was on a crew. He told me that, as a co-pilot, I'm supposed to be like a mother hen to keep peace among the crew when things get edgy. Now that things began to deteriorate, I had to figure out how to make that concept work. On many days, no matter what was said or done, the crew dynamics were just off. The upside to that was that we weren't posed with any pressing problems or emergencies that required a high level of CRM.

Fast forward a few weeks: our crew was doing some staging missions out of a different location. Things were looking good; we saw different lands and had a good time in the process. All was well until the last day of our staging mission. We were scheduled to go downrange and pick up some important people. The flight was to be 2½ hours down and 2½ back. As Murphy would have it, we experienced generator issues 30 minutes out from our destination. We made a decision to turn around instead of landing, shutting down, and getting stuck downrange.

On our way back to our staging location, we began to figure out the issue and our best course of action. About 20 minutes out from our destina-

U.S. Air Force photo by SrA. Aaron Allmon II

tion, we experienced a momentary complete loss of electrical power. The autopilot kicked off, all lights went out, the flight deck got quiet, and then things came back on line. We had no idea if the two problems were connected. The engineer began to run through scenarios and ideas of what was wrong and how we could fix the problem. Worst case scenario, we'd be stuck.

We arrived at our staging location without additional issues and decided it wasn't necessary to declare an emergency. En route to our destination, we discussed how the aircraft commander was scheduled to depart the deployment once we returned, so he could get home in time to PCS. It became obvious to the entire crew that the AC was anxious, had an agenda, and was very serious about it.

Once we were back on the ground, the engineer began to work the issues with maintenance. The rest of the crew was informed of the severity of the issue and the possible outcomes of taking the bird home without bringing in more maintenance folks to recheck the plane. The AC wasn't satisfied with this, as it would delay his return home and possibly interfere with his PCS. By now, CRM was being thrown out the window, as the situation deteriorated to a crew-versus-AC situation. The crew expected me, as the co-pilot, to persuade the AC to keep the plane on the ground and wait for further maintenance.

The AC, despite the expressed concerns of the crew, decided that flying the plane home would be better for his agenda, and he was willing to take a chance. The flight back to our deployed location was pretty quiet and tense as a result of a few heated discussions. I was thankful that the flight home went well and there were no additional issues.

In hindsight, I realize I could have and should have done things differently with respect to CRM and the safety of the crew and plane. After the heated discussions and the manifestation of get-home-itis from the AC, the first thing I should have done was contact the DO, ask him to send a replacement AC, and arrange for the current AC's return home. It became obvious that the AC was so focused on making it home that he wasn't willing to consider the crew's input to the situation.

Many times we hear of mishaps that start with poor CRM; it's obvious that some flights are doomed from the start. Unfortunately, there are probably 10 times as many stories that have bad CRM but no mishap, so no story to tell. I encourage you to think about situations of degraded CRM that can be lessons learned, even if no mishap occurred. Being informed about how CRM can break down, and talking about what could have been done differently, can help us hone our skills and continue to keep mishap rates down.

The Error Chain

ANONYMOUS

We've all heard about the "error" chain that precedes mishaps. We all try to look out for one, and when it happens, it can often catch us off guard. We may notice an occurring error chain at the worst of times, when quick thinking is the only way to stop the chain. A couple of years ago, during a combat support mission in Southwest Asia, I was fortunate enough to notice an error chain that almost went too far.

It was my second time to this airfield in the Middle East. The field didn't have an instrument approach; it was a VFR-only airfield. The mission originated in Europe and involved an early showtime and a long crew duty day. My crew was very experienced, particularly my co-pilot, who had been to this field many times. My guard was rather low, but I had a crew I could count on.

Despite the favorable weather forecast for this airfield, it became evident the conditions were marginal, at best. The tower was calling the field VFR. However, at a close-by IFR-capable international airport, ATIS was calling the visibility near the ILS minimums for that airfield. How could that be? My destination was calling VFR, and the airport 30 miles away was at ILS minimums? My crew reassured me that this weather was typical of the region. The desert fog and dust would limit the visibility, but not to the point of the runway being out of sight. The sun was setting, the arrival time was nearing, and I was starting to feel the pressure of attempting the approach. Our flight duty period was running out and we were tired. The alternative, given our fuel situation,

U.S. Air Force photo by SSgt. William Bennett
Digital Illustration by Felicia M. Hall

was to take vectors and shoot an instrument approach to the international airport. But with no support there and with the lack of flight duty period remaining, I knew that a divert would cost us hours on the ground, an inconvenience to our support structure, and a long delay to the mission.

The airport was just beyond a large city. The first time I had gone there was during the day; the visual approach was easy. Approach would descend us to 2,500 feet, give us a vector, and stand by until we called the field in sight. Approach would then hand us off to tower for a standard VFR straight-in approach to the runway, or a downwind approach to the opposite runway. Two miles north of the straight-in runway was a prohibited area, and a gigantic mosque was on the approach end of the opposite runway, causing a displaced threshold. My plan was to use the plane's advanced navigation systems to put me on a dogleg to final away from the prohibited area.

As we approached the coast and arrived at 2,500 feet, I became concerned with the limited visibility. There was no ceiling, but the buildings below looked blurry. Halo effects were on all the lights below, and fog and dust were in the night desert sky. I followed my flight director and my co-pilot's inputs, who described all the landmarks and buildings as we flew over them. He had done this approach dozens of times, and his confidence was very convincing. Approach began to pressure us to call the runway in sight. The city continued to pass by below us as we held 2,500 feet. I began a very shallow descent on a shallow glide path to the runway, based on our distance to the field. The co-pilot called the runway environment in sight. Approach figured that this was good enough for them, and switched us to tower.

According to the navigation systems, we were on a perfect dogleg to final. The visual glide path looked good based on our distance to the airfield. The only problem is that I didn't see the runway! At this point, the co-pilot confidently said, "I have the runway in sight." I replied, "Co, you have the aircraft; continue the approach." Tower cleared us to land. I realized then that we were in the middle of an error chain. The co-pilot had aligned us perfectly to the highway that ran parallel to the runway! I immediately took the controls and initiated a go-around. The loadmaster pointed out the runway, about a half-mile north of us, parallel to our flight path. I requested a VFR pattern at 1,000 feet and stayed away from the mosque. I took the plane around for an uneventful landing on the runway. As we were on final, I remembered the suitability report that I'd read the day before that explained the monodirectional lighting on this runway. The long day, the early showtime, the lack of alternates, the low fuel, the co-pilot's confidence and experience, and the crew's pressure to land incited an error chain that I was following until the last seconds as we were on final to a highway.

As I look back at that episode, I could have done so many things differently. I could have queried tower's VFR observation, or asked approach to clarify the weather report of both fields. I should have briefed the runway's monodirectional lighting, which we weren't going to see in a dogleg to final. As we overflew the city, the obvious blurry lights should have made it clear to me that a VFR approach was not the best option. I could have taken vectors to the ILS at the nearby airport.

I was fortunate enough to break an error chain that was leading us to disaster. I feel fortunate and have learned a very important lesson. Sometimes the obvious is overlooked so the easier course of action can be carried out. I know now how it feels to be in the middle of an error chain. I hope I don't feel this way again, but if I do, I'll be ready.

U.S. Air Force photo by TSgt. Brian Davidson

Become Brilliant

ANONYMOUS

"There I was." What aviator doesn't have a story that starts like this? Some stories will never see the light of day. They're internal lessons learned that only apply to me and my perpetual learning curve in the flying business. There's a saying that goes, "A wise man learns from his mistakes. A brilliant man learns from others' mistakes." Let me make you brilliant men and women.

There I was, a newly minted flight lead, leading a two-ship of the world's greatest fighter, the mighty Viper, to provide realistic threat training to two Marine F/A-18Cs. What's better than DACT? Great! Sign me up! Everything was ops normal and straightforward. After receiving a Red Air SPINS fax from the adversary, we went over the presentations at length over the phone, flight lead to flight lead. We were set, all questions asked and answered; the brief went smoothly, covering all the bases. My wingman and I briefed the weather at length, reviewing the radar picture and forecast. It was summer and thunderstorms were the norm in the early afternoon. I noticed on the weather map we had buildup near our working airspace, and I made a mental note for later. Again, I was pretty confident I could get my two-ship out and back, provide realistic training and update any currencies, time and average sortie duration permitting.

Departure and en route to the MOA airspace was ops normal. No problem. I checked in with the Hornets and passed the MOA weather brief to our adversaries. "Sky clear, unlimited visibility, with thunderstorms building south of the working airspace, appearing to move toward us, but not currently a factor." We set up for our first red air presentation. Things went smoothly, and we reset our two-ship to the south of the MOA for another presentation. I noticed the thunderstorm getting closer and repositioned my flight to avoid the weather, while stepping up the red air scenario, in accordance with the brief. After several sets of red air, I noticed that the thunderstorm had moved across the MOA's south border and started to become a factor to the flight.

I found a section of the MOA airspace that provided enough room for the fourth and final presentation, a 10 nm lead-trail picture, with me as the trailer. Skirting safely around the thunderstorm, I was pushing it a bit, but I wanted to give the Hornets the training they needed. As I set my wingman in front as the leader and maneuvered my Viper in the trail group, I became heads down. In other words, I was buried in the "drool bucket" trying to perfect the lead-trail presentation. When

U.S. Air Force photos by MSgt. Jack Braden
Digital Illustration by Felicia M. Hall

I looked up, I noticed I was entering a cloud. Not a dark, evil-looking cloud, but the white wispy kind. I didn't think much of it then, besides that I was busting a training rule, since I thought I would just pop out on the other side and continue the presentation. But the white wispy cloud got darker — much darker. The next thing I knew, I was entering a full-up, angry thunderstorm.

Time stopped. Then the rain came and what I thought at first was hail that later turned out to be heavy rain. But that was the lesser of the two evils. As I slowed my jet to thunderstorm penetration airspeed, it felt like the world was beating up my jet. Rain slammed the canopy, and I had zero visibility. It sounded like evil beings were hammering away on every piece of my Viper. I was tossed around. I couldn't hear. I couldn't see. I lowered my seat and turned up the lights. I stared at my engine gauges like a hawk, saying a silent prayer that my single engine would not flame out due to water ingestion. As I was sitting there staring, I noticed the radios had become instantly filled with static. "Oh no," I thought, "here it comes." The first lightning hit was like being blinded by a flash that didn't go out. I never heard the crack, but I sure felt it. The hair on the back of my neck stood up, and I was thinking, "This is not good." I saw the bolt hit the nose of the aircraft and that was about it. My hands and arms were off anything metal. I was hunkered down. My headset filled with static again, and I prepared for another lightning strike. Bam! Bam! I counted several more lightning strikes in seconds.

What felt like an eternity was soon over. I popped out on the other side of the thunderstorm into bright blue sky. It was an eerie transition. One second, chaos; the next, calm. I called a knock-it-off as soon as I could and instructed my wingman to rejoin. The Hornets were finished and were departing the airspace. My No. 2 rejoined, and I told him I just went through a thunderstorm. I told him to do a thorough battle-damage check to see what was damaged. I knew my AIM-9 seeker dome was missing, broken off either by the rain or hail. It was flapping in the wind. Other than that, from my vantage point, everything looked normal. That's when No. 2 got back on the radios.

My wingman informed me that I had some slight damage to my centerline ECM pod, my AIM-9 seeker, and some gray paint missing on the right horizontal stab. We RTB'd and called the SOF. After landing from a straight-in approach, I shut down and egressed normally. Then I surveyed the damage. Not good, but I was lucky. Very lucky. It could have been worse — much worse.

There is no peacetime mission that justifies penetrating a thunderstorm. Become brilliant.

Photo courtesy of the Canadian Air Force

The Aviation Well Done Award is 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.

On Nov. 29, 2007, members of the Canadian Forces 408th Tactical Helicopter Squadron were on deployment in support of Exercise Gander Fury in Fort Sill, Okla.

Master Corporal Dale Warren had just completed a preflight inspection of a CH-146 Griffon helicopter when he noticed that an American C-130 Hercules aircraft out of Youngstown, Ohio was about to taxi out to the runway for takeoff. His attention was drawn to a large piece of yellow material flapping behind the trailing edge of the aircraft's starboard wing. Recognizing this was not a normal condition, Master Cpl. Warren consulted CF Warrant Officer Ray Tanguay, who had extensive knowledge of the Hercules aircraft.

Warrant Officer Tanguay quickly recognized the yellow material as part of a flap from a partially deployed life raft. Both immediately proceeded to the front of the taxiing American aircraft and signaled the crew to stop. The Hercules aircraft captain and flight engineer disembarked the aircraft and were briefed of the potential danger by Warrant Officer Tanguay. The aircraft was then shut down and rendered unserviceable pending repairs.

Master Cpl. Warren's and Warrant Officer Tanguay's superior attention to detail and professionalism were noteworthy and clearly displayed a high degree of airmanship and concern for all fellow allied personnel and aircraft. Their selfless act is the cornerstone upon which mutual respect is developed, and fully demonstrates that they are truly deserving of this award.

Class A Flight Mishaps

FY08 (thru 27 Mar 08)

	Class A Mishaps FY08	Same Date in FY07	Total FY07
ACC	3	3	8
AETC	2	5	5
AFMC	0	0	1
AFRC	1	1	1
AFSOC	0	0	1
AFSPC	0	0	0
AMC	2	2	3
ANG	3	1	5
PACAF	2	0	1
USAFE	0	0	1
AF at Large	0	1	1
TOTAL	13 / 1.33	13 / 1.33	27 / 1.32

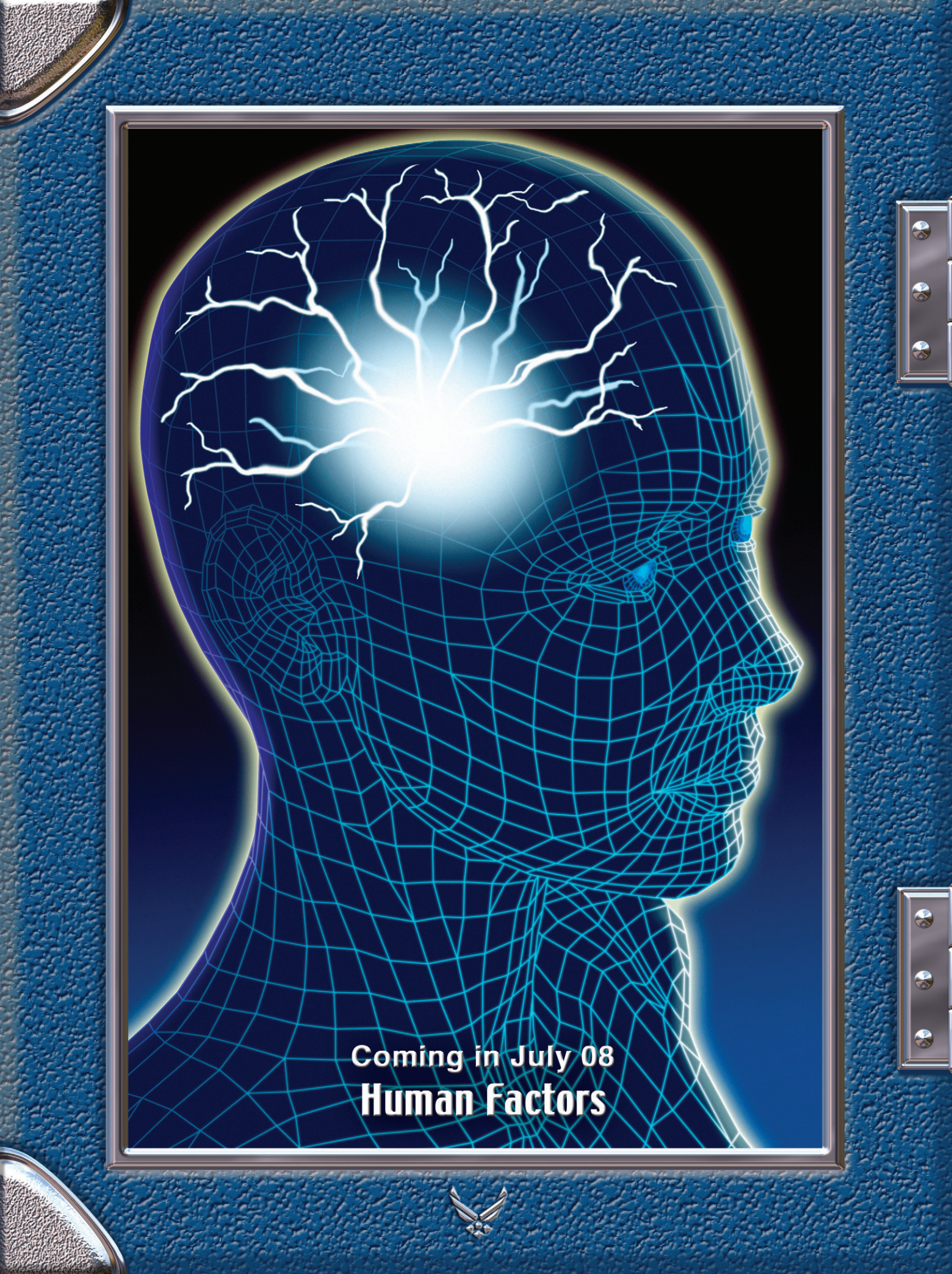
Flight Rate Producing

01 Nov 07	F-22A	No. 2 engine FOD discovered during postflight walkaround
02 Nov 07	F-15C	">" Crashed on training mission; pilot safely ejected; minor injuries
20 Nov 07	E-8C	E-8 hard landing; wg/pylon/gear/radar damaged
28 Nov 07	T-6A	">" Dual T-6A midair collision; both ejected safely
29 Nov 07	HH-60G	Hard landing during brownout; damaged FLIR, WX radome
15 Jan 08	F-16C	">" Aircraft crashed in ocean during night trng mission; pilot safely ejected
01 Feb 08	F-15D	">" Aircraft crashed in water/destroyed on trng mission, pilot safely ejected
20 Feb 08	F-15C	">" Dual F-15C midair; 1 pilot ejected safely; 1 fatality
23 Feb 08	B-2A	">" Aircraft crashed on takeoff; both pilots ejected safely
14 Mar 08	F-16C	">"Aircraft crashed during student training; 1 fatality

UAS

29 Nov 07	MQ-1B	">" Departure from controlled flight; destroyed on impact; unknown
17 Dec 07	MQ-1B	">" Lost link; destroyed on impact; undetermined

- A Class "A" aircraft mishap is defined as one where there is loss of life, injury resulting in permanent total disability, destruction of an AF aircraft, and/or property damage/loss exceeding $1 million.
- These Class A mishap descriptions have been sanitized to protect privilege.
- Reflects all fatalities associated with USAF Aviation category mishaps.
- ">" Denotes a destroyed aircraft.
- Air Force safety statistics are online at: ***http://afsafety.af.mil/stats/f_stats.asp***


Coming in July 08
Human Factors