

THE
MOBILITY
Air Mobility Command's Magazine
FORUM

July/August 2003



**Recipe for
Disaster**

**Emergency Airdrop
and Evacuation**

**The Heat
is On**

**Freedom of
Navigation**

THE MOBILITY FORUM

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Volume 12 No. 4

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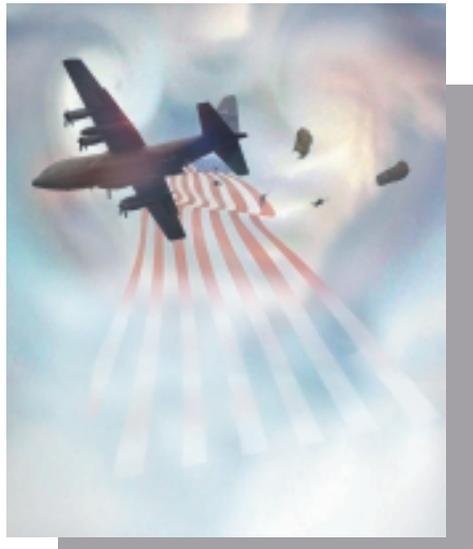
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A C-17 Globemaster III parts the skies over western South Carolina during a training mission on Feb. 2, 2003. **DE**

Photo by SSgt. D. Myles Cullen

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REGULAR FEATURES



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Summer is here! Daily high temperatures at many of our locations in the CENTCOM AOR exceed 110 degrees Fahrenheit. So in addition to the ongoing force protection concerns, we add thermal stress and dehydration. This issue tackles heat stress and fatigue head on with three timely articles.

I also highly recommend reading all three articles on professionalism. The first KC-135 article, “In Harm’s Way,” fleshes out recent news reports from the crew’s perspective. The second, “South Pole Emergency Airdrop . . .,” tells how the mobility system and this C-141 crew completed a life saving, emergency airdrop that was recently made into a television documentary. And the final article, “CRM: A Case Study,” although highlighting civilian airline operations, will resonate with many military professionals.

Our “101 Critical Days” campaign is well underway. Unfortunately, one AMC member did not survive an off-duty motorcycle accident. Overall, our ground mishap rate is down, but we need to continue to use good personal risk management. It is too easy to lose our focus, especially when the pressure of mobility combat operations appears to have passed. Most of the recent casualties in OIF and OEF are from accidents, not enemy actions. Please rethink your personal approach to risk and do not accept any unnecessary risk.

Do you support safety programs? I’m sure your answer is a resounding, “Yes!” After all, you’re reading this safety magazine. But what have you done about safety lately? Have you reported the *almost* mishaps? I’m troubled by the small number of AMC Form 97s and AF Form 457s we see, and the rough, non-standard operating conditions and procedures reported in recent mishap investigations. Are we overlooking the hazards because we are used to them? Your hazard reports will highlight risks and get appropriate, high level attention on those risks. As we continue to operate from forward, rough airfields, let’s work together to reduce the risk.

And always, let’s be safe out there.

Col Ron Bean

In Harm's Way

Three Tanker Pilots and Their Moments of Truth

By Moira K. Wiley



From left to right: Capt Brian Gilpatrick, Capt Doug Shaffer, Capt Nathan Howard.

Ninety-nine percent of our careers are devoted to training safely...building up to that single moment when every skill, training exercise and decision-making muscle is put to the test. Three tanker pilots from the 384th Air Refueling Squadron at McConnell AFB, Kansas, have each experienced that moment of truth in which teamwork, training and

courage paid off. Here are their stories.

Stepping up to the plate

It was early morning on 7 April 2003, during Operation IRAQI FREEDOM. Capt Nathan Howard and his crew were scheduled to refuel some F-16s. Prior to

reaching their AR track, however, they were informed of a search and rescue effort for the crew of a downed F-15. The F-15's two crewmembers were on the ground in the vicinity of Tikrit and quickly running out of time to avoid capture. Capt Howard's team had just started their mission when they received the call to assist with the rescue effort.

As they were vectored north out of their AR track, the crew knew they were entering a significantly more dangerous area.

“As a crew we had to make the decision to go deep into the heart of the danger zone, deep into the heart of a high threat area,” said Capt Howard. “This made the flight more significant than most, because although we carry parachutes on board, it’s abnormal for tankers to have them readily available. Obviously, they are there for an emergency, but we rarely are in a situation where we feel we may have to use them. In this situation, we definitely had our parachutes out and next to us in the seat. We were taking a bit more precautions and that felt slightly uncomfortable.”

Much of what the crew executed during the mission was routine — it was the stuff they had been training for since the first day they joined the Air Force. The urgency of the downed crew’s situation created the decision making moments in which the aircrew would have to decide whether to accept a mission into a threat area where no tanker was supposed to go. The decision to risk their own lives for the lives of their fellow pilots demonstrated both the courage and commitment of this team to assist in the rescue of one of their own.

The tanker continued north with the vector they had been given, which was actually facilitating a rendezvous with an F-15 that was short on fuel near the search and rescue effort. As they approached, they quickly coordinated efforts with other fuel-starved aircraft in order to be ready when they reached the F-15.

“At the receiver’s request, we ended up doing that refueling in a descent, in a maneuver called the toboggan,” Capt Howard related. “While we were up there, we also refueled another set of F-16s and three more F-15s. They took us

down to BINGO fuel, which is basically the amount fuel you need to get home safely.”

The AWACS kept the tanker close to the receivers who were looking for the missing crew. When they were first sent to the north out of their track, into an area not cleared for tankers, there was a moment when they paused and hoped that AWACS fully understood the situation.

“That’s the information we didn’t have and we just had to trust them, because things were happening so fast. Although we study before the mission to identify where the threats are, we just hoped they (AWACS) studied as well,” noted Capt Howard. “We did call them one time before leaving the track just to ask if they were sure this is what they wanted us to do. They informed us that yes, we were needed there and that was all it took. I don’t think there was anybody on the crew that had any reservations; this is what we needed to do.”

The top priority at the time was rescuing their fellow airmen who were on the ground and trying to avoid capture. It was critical to keep the searching aircraft fueled so they could continue their efforts to find the downed men. It was the most dangerous sortie they had ever been assigned, but one they were quite willing to engage.

“This is something we all signed up to do. We all signed on the dotted line that we were willing to support and defend the Constitution and we knew this type of situation might arise someday and you kind of prepare yourself mentally before it happens,” explained Capt Howard. “As we departed Iraq, it was quite a relief to be able to take the parachutes back out of the seat. It was a little bit humbling and we were all definitely thankful to come out alive, because there was always the possibility that we were within moments of being hit by a

surface-to-air missile.”

The crew offloaded 96,000 pounds before returning home. The mission was a huge effort coordinated through AWACS.

“All this effort was, of course, geared towards doing what we could to find these guys,” said Capt Howard. “It’s significant that we went up there and took the risk, but it’s a shame that in the end, the F-15 crew didn’t make it.”

The actions of Capt Howard and his crew during the mission earned them the Distinguished Flying Cross. Lt Gen T. Michael Moseley, Combined Forces Air Component Commander, delivered the medals on April 11, and thanked the crew for their bravery and heroism.

Blind in the war zone

During Operation ENDURING FREEDOM, Capt Brian Gilpatrick found out just what it’s like to be flying blind. What began as a typical mission soon turned into a potentially deadly situation when the aircraft’s navigation instruments flickered and then shut down. With the help of his crew and their training, this team lived to fly another day.

The crew had just finished their refuelings for the day and the KC-135R was cleared to return to base (RTB). As they started their trip out of Afghanistan, an ominous flicker crossed the instrument panels. All the instruments on Capt Gilpatrick’s side went blank, followed by the instruments on the copilot’s side and subsequently the navigator’s.

“The only instrumentation we had left was our standby attitude indicator, standby compass, airspeed indicator, altimeter, and engine instruments,” said Capt Gilpatrick. “We really had nothing to navigate with. There we were in a combat zone with no navigational

abilities, save our whiskey compass.” It was difficult to imagine a worse scenario; but worse it would become.

The captain and his crew began to troubleshoot, but were unsuccessful in restoring any equipment. They had about a three-hour flight ahead of them, which would carry them through several countries and across both the Gulf of Oman and the Persian Gulf. They needed to quickly find another means of returning, because flying without navigation instruments wasn’t going to be the safest or easiest thing to do.

“Initially, I checked to see if anyone else on the crew had seen anything like this before or if they had any ideas of what may have caused it. My next concern was where to land — our deployed location or another friendly base where we could get the airplane fixed.”

It was at that point the crew had to decide if they should try to do it on their own or if there was another way they could get back. Suddenly, they heard another tanker up in their area, which was also getting ready to RTB and Capt Gilpatrick knew this tanker could probably help them. Because they frequently train to fly formation, he felt comfortable with the option of flying in formation with another tanker to get them to a base safely.

“We radioed the controlling agency and asked if they could still see us on their radar,” said Capt Gilpatrick. “Although we had a general idea where we were from our last known position, we couldn’t pinpoint anything, so the controller was really helpful. He set us up in a vacant AR track, which we maintained by setting up a circular orbit. This allowed us to stay in approved airspace while we worked the problem. We also requested that the controller vector the other tanker to us.”

At that point, the controller started giving the other aircraft directions to join

up with Capt Gilpatrick’s plane. Once they got close enough, Capt Gilpatrick and his crew could visually identify the other plane and they quickly got into formation with them.

“They started doing all the navigating for us,” he said. “The plan was to follow them back to our base. They weren’t scheduled to land at our location, so a new flight plan and the required diplomatic clearances had to be coordinated. Once we got approval, we continued on our flight.”

There was, however, another concern the crew was going to have to address—the weather. Inclement weather would



make following the assisting aircraft next to impossible. As fate would have it, bad weather would indeed wreak havoc on the crew’s ability to keep a visual on the other tanker and they would eventually have to continue on their own with very minimal navigational ability.

“The possibility of bad weather became one of our top priorities,” Capt Gilpatrick related. “We started calling right away to see what we could expect. The reports generally indicated that we shouldn’t have any problems. Little did we know, those reports were not painting the whole picture.”

As they got closer to the base, the crew started seeing a lot of clouds and some precipitation. The crew still had about another 100 miles to go before reaching their base when the worst thing happened...they lost their lead tanker in the weather. It just disappeared from sight. With the equipment they had left, they couldn’t chance staying with their

escort. Staying that close to the other tanker would only be a hazard. Because they couldn’t keep a precise heading or stay on the same course as the lead tanker, they had to coordinate to split off from them and get their own vectors from air traffic control.

“Air Traffic Control (ATC) was able to see us and tell us when to start and stop our turns in order to vector us towards the base. They ended up directing us in that way, through the rain and the thunderstorms in the area. They also kept descending us until we finally got below the clouds and we were able to see the runway. Ten miles from the field and finally able to take over visually, we brought the aircraft in for a landing.”

From the time the crew lost their instruments, it took approximately four hours before they were able to land. They efficiently went through all their procedures and checklists to try to get the systems back, but an apparent anomaly in the software programming seemingly deleted and corrupted the navigational system, rendering them useless. Through solid teamwork, the crew was able to work through the dangerous situation and land safely.

“As the aircraft commander, I ultimately felt responsible for getting everyone home safely, but I knew that I had an extraordinary crew that was up to the task. Everybody on the crew rose to the occasion. Over-flying several countries, and bodies of water with no navigational ability is no easy task and definitely something that we never thought we would have to experience. Obviously, this flight took a tremendous amount of teamwork and coordination. Everybody had an invaluable role in safely completing this mission.”

Coincidentally, the crew in the other aircraft was also from McConnell AFB, actually the same squadron. Capt Gilpatrick said it was reassuring to have a familiar voice on the radio, but he was

confident that even if he had not known the airmen, the results would have been the same. Everyone goes through similar training, he explained, and does things in a standardized way.

Mayday

It was the third night of Operation ALLIED FORCE and Capt Doug Shaffer, a 1Lt at the time, was a brand new co-pilot, just recently mission qualified. This specific mission was, in fact, only his fifth mission as a qualified co-pilot in the KC-135. Although he went on to fly in both Operations Enduring Freedom and Iraqi Freedom, the mission on the night of 27 March 1999 was one he'll never forget.

He and his crew were flying tanker support for combat air patrol over Kosovo under the command of Capt Mark Boroni. They had multiple refuelings that night and were on their last refueling of the evening after offloading 68,000 pounds of fuel. It was a very active night, similar to those on their previous missions, but on this particular night there were enemy MIG-29s airborne that had set up their own orbit and were making periodic runs in the direction of the tanker.

"At the time of the incident, we were dealing with the MIG-29s and had heard AAA reports and kind of a confused, reported SAM launch," said Capt Shaffer. "We weren't really sure at the time, and I'm still not fully sure exactly who reported what, but as we turned away from the threat in our refueling track, I looked out and saw an airborne explosion on the horizon. Shortly thereafter, we heard a mayday call from what turned out to be an F-117 pilot who had been hit."

The crew's immediate reaction was one of disbelief. They were refueling at the time of the call with an F-16 on the boom. The boom operator was in the

back of the plane refueling, Capt. Shaffer was monitoring the autopilot, talking on one of the radios and running the fuel panel for the offload while the Nav was plotting the threats.

"When we heard the mayday call, we turned to each other and we were just shocked. I remember one of us saying, 'Hey, we just lost a friendly.' Then, when we heard the mayday call again and still nobody answered, we were even more shocked. I never thought I'd ever hear a mayday call and if I did, I assumed that numerous people would respond to it. I had always been told that if you sent a mayday, you would have to pick one and tell everyone else to shut up, because you were going to get an overwhelming response to that...but nobody responded."

The crew's surprise over the fact that no one was answering was compounded by the fact that they, as a tanker crew, were neither situationally aware nor had the appropriate combat capability to respond to the call. The crew continued to listen and record what they heard so they could report their observations if needed. When they heard the downed pilot call a third time and still not receive a response, they determined they needed to answer.

"We didn't know if it was just a quirky radio thing or we were just in the right place or whatever, but our aircraft commander switched over to Guard and answered," Capt Shaffer said. "Initially, the mayday call was in the third person and it was crystal clear, so we assumed it was somebody reporting a wingman shot down. And, when we answered the guy, he was very calm, very controlled. He didn't sound scared or excited. But, it turned out he was actually talking to us from his parachute on his way down. It was really kind of eerie. You would think there would be wind noise or something else, but it wasn't like that, it was very

crystal clear, and he was so calm about the whole thing. We found out where he was located and that he was okay, and then relayed all that to AWACS. This started the search and rescue operation that eventually got him out."

The crew was already nearly at their BINGO and needed to return home. They lost contact with the downed pilot shortly after reporting his location to AWACS.

"We later learned that other people were trying to respond to him, but they didn't switch over to Guard frequency to try to call. They keyed their radio on whatever frequency they were on, because he did have the capability to transmit on the Strike frequency. But, we, as tankers, knew that nobody is going to switchover to a Tanker Control frequency from Strike frequency to declare a mayday, so we realized immediately it was on Guard. It wasn't that anybody was ignoring him; they were just on the wrong frequency. There was a tape of the radio transmission that night and you could hear people urgently trying to reply to him, but we didn't hear any of those replies. We were just at the right place, at the right time and realized he was on Guard. So, we started the ball rolling that eventually got him back."

The crew later met the pilot. Capt Shaffer revealed it was a really good feeling to know they had played a small part in his rescue, but that it was also humbling.

"All we did was initiate the process, which was also important, but as he thanked us, it was really hard to know what to say. He and the people that went in to get him were definitely heroes, but as far as what we did, it was almost awkward being lumped in with everyone else. However, it did feel great to have him come up and say thanks for being there and it's something we're all very proud of."

Endurance Management: Maximizing the Air Force's Most Vital Asset

Lt Col David O'Brien
Chief, Flight Medicine
AMC Office of the Surgeon General

Capt T. M. Rock
Aerospace Physiologist
22d Aeromedical-Dental Squadron

The mission never sleeps. Of course we mortal airmen must sleep. The steady beat of the Air Force goes on no matter the season, the weather, or the most recent overseas contingency. As we have transitioned to the Expeditionary Air Force, we have proven that we are capable of accomplishing more than we ever dreamed possible. And our pace has increased even more dramatically since 9-11, not only deploying to the CENTCOM Theater of Operations, but also protecting our homeland. And despite the awesome machines and technology that our Air Force brings to bear, the mission still relies most critically on those in uniform. Thus, in large degree, the key to mission effectiveness is taking full advantage of the "human weapon system".

It takes dozens of personnel to successfully launch one aircraft in the air. Akin to an aircraft engine, when the human engine is not running on all cylinders, the resulting hiccups can affect the mission all the way down the line. And like the routine maintenance we provide for aircraft engines, the human weapons system needs rest to overcome normal wear and tear of physical and mental fatigue. Air Force leadership has recognized that the human being occasionally experiences critical failures and has taken many steps to make us more aware, more safety conscious. We all know about the 101 critical days of summer, we all practice Operational Risk Management. Aircrew members are highly trained to use Crew Resource Management. These programs are vital to enhancing mission effectiveness, but it does not stop there.

How we care for ourselves and our troops on a daily basis plays an important role in mission effectiveness. Fatigue continues to be a major factor in many Air Force ground and air mishaps. We do not have the luxury of a 9 to 5 workday. Controllers are in the tower, maintainers are turning wrenches, security forces are on patrol, and crews are in the air during all hours of the day and night. Our people are traveling across numerous time zones, setting up shop and taking care of business. Fatigue will eventually take a toll if not properly managed. Thomas Edison's desire to invent the light bulb was driven by the idea that if one could bring light indoors, people could work 24 hours a day, revolutionizing industrial production. Although a brilliant inventor, Edison did not understand human biology. Over the years, leaders, supervisors, doctors and families concluded that this theory was misguided. Without sleep, the natural results of fatigue are well known to most of us: impaired judgment, slowed reaction time, reduced motor speed, decreased situational awareness and poor attention to detail; compromised skill sets that are essential for our highly technical and time-sensitive operations. Sleep remains an essential part of life.

Fatigue causes mistakes, creates mishaps and costs lives. Amazingly, when daylight savings time occurs and we lose only one hour of sleep, traffic accidents rise across the country! Fatigue impairs our actions and decision-making capabilities. Fatigue poses a serious threat to mission effectiveness and safety. Fatigue kills more airmen in motor vehicle accidents than any





A paratrooper from 1-508 INF ABN BN, is being treated by medical personnel for heat exhaustion during Airborne Operations conducted by the 173rd Airborne Brigade at Vitina Drop Zone, in Kosovo. The soldiers were in Kosovo in support of Operation Joint Guardian II.

Photo by SSgt. Jonnie Wright

other factor. The Air Force takes fatigue seriously enough to mandate crew rest for aircrew, and now we are expanding that knowledge to all Air Force personnel. We all have to understand that even though we possess incredible work ethic and superb motivation we also have physical limitations. Supervisors have the responsibility to balance mission priorities with personnel capabilities and capacity. They must be involved with their troops who accomplish the daily tasks and be attentive for *warning signs*. Are “simple” mistakes being made? Are technical forms not fully completed? Are troops easily agitated over minor issues? Do they just look a little worn out? Have they lost their sense of humor? If we notice these things, it is critical to ensure we are not needlessly fatiguing the troops.

So what is the fix? First, realize that fatigue is inevitable, but managing endurance and preventing excessive fatigue is our pragmatic goal. Sleep is the foundation of fatigue recovery. Most people require 7 to 8 hours of sleep per day to avoid cumulative fatigue. Studies demonstrate a small increase in errors when people sleep 7 hours per day versus 8 hours. Most individuals experience a clear drop in performance when sleeping 6 hours per day. Performance drops precipitously when sleep is 5 hours or less per day. Personal discipline must come into play here, but education is key as well. We must put more emphasis on our sleep habits. Keep our sleep time sacred. If you are constantly dragging yourself out of bed each morning, your body is telling you something: you are not getting enough sleep. It is human nature to cut corners on sleep because other things seem more important. The sleeping environment is also important. Sleep is more easily started and maintained in a quiet, dark, temperature-controlled room. Ideally, we go to bed and awake at the same times every day - though clearly many of us cannot maintain that sort of stability with our military commitments. Avoid the use of alcohol and caffeine several hours before bedtime, they both interfere with the rapid eye movement (REM) phase of sleep, vital to body and brain recuperation.

Other techniques for enhancing sleep include winding down for 10-30 minutes prior to bedtime, by reading, listening to

quiet music or other calming activities. Bedtime is not the time to dwell on the problems of the day, but rather to put them aside until refreshed in the morning. For those traveling across international timelines, getting to sleep can be frustrating as your body starts to wake up according to its internal body clock based on home station (AKA circadian rhythm). Quality billeting quarters, nutritious meals, avoiding alcohol, and moderate exercise can all contribute to better sleep.

For AMC aircrew experiencing jet lag or changing their circadian rhythm, the occasional use of flight surgeon prescribed “No-Go” pills may also be helpful. No-Go pills have been used by USAF aviators for over three decades to help folks sleep during the day, typically when transitioning to night operations or rapidly adapting to a new time zone. Unlike alcohol, which interferes with normal sleep patterns, No-Go pills help initiate normal sleep cycles. AMC recently approved the use of No-Go pills for mobility aircrew when certain operational conditions exist: 1) Home station night launch missions greater than 4 hours duration; 2) Off-station missions that are 4 or more time zones from home station; 3) Rotating schedules (stair-stepped flying schedules) with greater than 6-hour flight time duration; and 4) Missions that run consistently near a 14-hour (or greater) duty day.

Flying unit commanders and flight surgeons work together to identify at-risk missions and approve the use of these medications. An example illustrates one appropriate use of No-Go pills: Your crew left the US east coast and has now arrived in Europe to offload cargo. It is now 1000 local, you have been awake for over 16 hours and are surrounded by jet noise and brilliant sunlight. Despite feeling tired and knowing your crew rest ends at 2200 local, your body is awake and cannot settle down enough to sleep. A No-Go pill and restful quarters can help your body get into a sleep cycle. Six hours later, your body has cleansed this medication out of your system and you start to wake up refreshed. The new generation of No-Go pills works quickly and does not typically cause sedation after awakening. Prior to operational use, aircrew must be ground-tested with these medications. Certain common sense precautions must be

followed, such as refraining from drinking alcohol or operating machinery when using a No-Go pill. For more information on this new program, see your local flight surgeon. “Go” pills, which are stimulant medications, are limited by USAF policy to single seat, high-performance aircraft and are not used by mobility forces.

Combat naps are another tool to overcome acute fatigue. Combat naps consist of short naps lasting 20 to 60 minutes that allow your body a quick recharge. Napping for more than 60 minutes can result in grogginess on awakening. Some supervisors have stigmatized napping as a sign of laziness. However, when properly planned and timed, naps can bring short-term relief to accumulating fatigue, allowing increased attention and improved judgment. Some individuals must train their bodies to nap. With practice, individuals can determine the best nap length and interval, as well as eliminate any grogginess when they awake.

A healthy lifestyle is a great aid to overcoming fatigue. Regular physical exercise conditions the body to sustain performance and delay the early onset of fatigue. Physical exercise is also an excellent relief valve for normal emotional stress associated with our busy lives. Avoid exercise within several hours of sleeping so your body is winding down at bedtime. The foods we eat can play a role in endurance and fatigue as well. Foods high in protein contain the chemical tyrosine. Tyrosine increases the production of neurotransmitters in our brain that enhance energy and alertness. So eating appropriate portions of meats, nuts, peanut butter, cheeses and fish can help your performance. On the other hand, eating foods high in the amino acid tryptophan can lead to sleepiness. When tryptophan reaches the brain it makes you relax and become sleepy. Turkey contains a great deal of tryptophan, as does corn, white breads and potatoes - so avoid significant portions of these foods when vigilance and attention are required during long duty days. We all remember falling asleep after eating a wonderful Thanksgiving dinner; great on a holiday, but not on a transoceanic mission. Finally, it is important to avoid concentrated sweets and fats during long missions. Box lunches don't always help us here, as they

frequently include candy bars and sugared sodas. The result of these products are soaring blood sugar highs followed by lowered blood sugar - adding further to our fatigue and decreased concentration. Fruits, vegetables, complex starches (bread, grain, rice) and protein provide a longer lasting, more sustained energy release.

The moderate use of caffeine can be used as a tool for alertness, but it can also hinder restful sleep. The body can handle about 200-250mgs of caffeine a day without too much trouble. A can of cola has about 38 mgs; a cup of drip coffee can have over 100mgs. When used for enhancing alertness, a caffeinated soda or coffee can be consumed about 30 minutes prior to a significant event, such as aerial refueling or descent/landing. Try to avoid drinking too much caffeine, as it can over stimulate the nervous system and impair quality sleep.

On the near horizon is a new tool to help aircrew and shift workers schedule sleeping periods and naps. The Fatigue Avoidance Scheduling Tool (FAST) is a computer program that processes work schedules and predicts levels of performance and recommends sleeping/nap strategies. The current test version is adequate for teaching and limited operational use. FAST can be accessed by aerospace physiologists who are assigned to your local aerospace medicine unit.

Long missions are a way of life in AMC, particularly during our efforts to support OPERATION IRAQI FREEDOM; our AMC aircrews are frequently flying 26-hour missions and back in the air again after a 12-hour rest period. This is a demanding schedule. Here is a wrap up with succinct, practical examples for aircrews and others to improve endurance during high ops tempo periods. Maximize your crew rest - avoid alcohol, read or listen to quiet music to wind down prior to sleep, darken your room, turn on a fan or wear earplugs to decrease ambient noise. No-Go pills can help initiate sleep and can be used for approved mission profiles. While flying, getting up for a stretch or walk can stimulate the mind and body. Moderate use of caffeine can also temporarily combat fatigue and increase alertness. When crew conditions permit, a short nap for 20 - 60 minutes offsets acute fatigue and physically refreshes. Limit eating and



Members from the 407th Expeditionary Services Squadron construct temper-tents April 24, 2003 at Tallil Air Base, Iraq during Operation Iraqi Freedom.

Photo by SSgt Shane Cuomo

drinking of concentrated sweets.

The mission is always our main focus, but we can't get the mission accomplished effectively without the special people who make up this great Air Force. Maximizing our performance by proper rest and avoidance of excessive fatigue is vital to the health of our body and our Air Force.

Cutting corners on our sleep time is something we have to avoid. Getting by on 5 hours of sleep for several weeks doesn't mean we can get used to it. What happens is we get used to performance that is way below our capability. We need our human weapon systems to be running on all cylinders.

FAST TIPS ON FATIGUE

Fatigue is a normal product of everyday life

Sleep is the only way to recharge our bodies and reverse fatigue

Most people need 7-8 hours of sleep per day

Sleep is best in a dark, quiet, temperature controlled room

Physical fitness provides a moderate increase in endurance

Napping 20 to 60 minutes can help temporarily restore performance

No-Go pills can help aircrew initiate sleep prior to authorized missions

A Recipe for **DISASTER**

By P.S. Harris

Take one normally competent and safety-conscious pilot, mix in one hot, sultry August day, a small amount of water, five cups of coffee and bake on a dry flight line or under an airplane canopy for an hour or more. The end result: a recipe for disaster!

During the hot summer months, the risks related to heat stress in pilots rise dramatically. These risks can include reduced G-tolerance; loss of peripheral vision; reduced performance, dexterity, coordination, alertness and decision-making skills. In extreme cases, it can lead to delirium, unconsciousness and even death.

Just how serious can heat stress be? In the Spring 2000 Federal Air Surgeon's Medical Bulletin, "Dehydration and the Pilot"; Rogers V. Shaw outlines three kinds of heat-induced illnesses. Shaw emphasizes that the transition from one to the other may or may not be noticeable, so a pilot may be unaware that he is in danger.

Here are the progressive stages:

1. Heat stress (*body temperature, 99.5-100° F*) leading to a reduction in:

- Performance, dexterity, and coordination
- Ability to make quick decisions
- Alertness
- Visual capabilities
- Caution and caring

2. Heat exhaustion (*body temperature 101-5° F*) leading to the following symptoms:

- Fatigue
- Nausea/vomiting
- Giddiness
- Cramps
- Rapid breathing
- Fainting

3. Heat stroke (*body temperature >105° F*) leading to the following symptoms:

- Body's heat control mechanism stops working
- Mental confusion
- Disorientation
- Bizarre behavior
- Skin is hot and dry because sweating has ceased
- If not treated immediately, heat stroke may result in convulsions, brain damage, death
- The pilot should be cooled by any method available

The single most important factor in each of the stress-related illnesses and reduced G-tolerance is dehydration. What is dehydration? Dehydration is the abnormal depletion of body fluids. Why have the body fluids been abnormally depleted? It is the body's way of trying to keep you from overheating.

Capt. Monte Anderson in his article "Heat Stress" for The Combat Edge, details the importance of skin for maintaining constant body temperature (98.6°F):

1. Capillaries (tiny blood vessels in the skin) exchange heat with environment. In hot weather, the capillaries dilate to allow increased blood flow and heat exchange on the surface of the pilot's skin (this causes the skin to appear red or flushed)
2. Skin allows evaporation. When the pilot's body temperature rises above 98.6°F, the body secretes sweat

containing water and salt from glands. This increases evaporation and heat loss.

3. Body decreases metabolic rate, lowering metabolic heat production at the pilot's body core. His/her behavior changes to decrease body temperature - he/she become lethargic and lies down (this decreases heat production and increases heat loss to regulate his/her core temperature).

Pilots can be at particular risk for dehydration because:

1. Pilots are wearing flight clothing which can become uncomfortably hot in the summer months.
2. Flight lines can be hot, dry and windy.
3. The humidity in aircraft cabins can be extremely low - drying out the skin which then demands more moisture from body core.
4. Pilots in aircraft with cockpits are sitting in what is essentially a greenhouse.

It is possible for a pilot to become dehydrated before he/she becomes thirsty. According to Dr. Daniel L. Johnson, "thirst is not a fuel gauge; it's a warning light. During a normal day, the body loses ½ gallon of water as the evaporation of sweat on skin. Most pilots will become thirsty with a 1.5-quart deficit, or a loss of 2% of total body weight. This level of dehydration

triggers the “thirst mechanism.” The problem, though, is that the thirst mechanism arrives too late and is turned off too easily. A small amount of fluid in the mouth will turn this mechanism off...and the replacement of needed body fluid is delayed.

By the time a pilot experiences thirst (approximately 2% dehydration) he/she may have reduced his/her work capacity by 1-15%. Dr. Daniel L. Johnson has reported that studies have been done on mental reactions which indicated that the “ability to do arithmetic, to recall words we hear, to trace a line quickly and accurately on a piece of paper, all are decreased at just 1% dehydration and steadily worsen as the water deficit grows. At 5% - 8%, you can probably keep walking, but you’ll have trouble figuring out what direction you’re going, and you surely won’t be able to thread a needle or calculate a heading.”

Dehydration is especially dangerous to pilots experiencing G-forces. Air Force pamphlet 11-419, “G-Awareness for Aircrews” warns that “Heat stress degrades the body’s ability to do work and reduces G-tolerance. The combination of dehydration and blood moving to the skin for cooling significantly reduces G-tolerance and work capacity. Studies have shown that only 3% dehydration reduces G-tolerance time by up to 50%. According to Todd Rock and 1Lt John Latimer in their article “Good to the last drop” in August 2001 issue of Torch, approximately 43% of Laughlin AFB, Texas, pilots who experienced G-induced loss of consciousness (G-LOC) did so during June, July and August.



Capt. Scott Inmon, an E-3 AWACS pilot deployed from the 966th AAC S, takes a water break, while waiting to depart for a mission on March 14, 2003. Members of the 363rd EAMXS work around the clock to support Operation Southern Watch at a forward deployed location in Southwest Asia.

Photo by SSgt. Matthew Hannen

In addition to G-LOC, dehydration can also produce a loss of peripheral vision. The condition is made worse by periods of prolonged inactivity which pilots may experience during extended flights. According to Dr. David G. Newman, chief instructor at the RAAF Institute of Aviation Medicine, movement of the leg muscles helps return blood from the legs to the heart so that it can then be pumped around the body. "Soldiers standing on parade," says Newman, "are well aware of the need to keep their toes wiggling in order to prevent themselves from fainting. Contracting the leg muscles not only moves the feet and toes but also constricts the big veins of the legs, forcing blood back to the heart. The muscles of the legs have been described as a second heart, in view of the fact that they help return blood to the heart against the force of gravity. Inactivity can cause the blood to progressively pool in the pilot's legs and not be effectively pumped around his/her body."

According to Newman, dehydration makes the situation worse. Newman explains that the loss of peripheral vision is known as grey-out, and is a precursor of G-LOC. "As increased gravity leads to blood pooling in the legs, the blood pressure to the head begins to drop. The heart can only pump out to the brain and rest of the body what it gets back from the legs. As the blood pressure drops, it reaches a point where it can only supply oxygen to the middle part of the retina. The peripheral part of the retina doesn't get enough oxygen, and this leads to loss of peripheral vision - tunnel vision. It is a warning that unless something happens to prevent it, loss of consciousness will soon occur. Dehydration is a well-recognized risk factor for G-LOC. Fainting on a parade ground after a period of prolonged standing is basically G-LOC at only 1G. The mechanism is the same - a lack

of blood pressure to the brain."

Perhaps the most dangerous stage of heat stress and associated dehydration is the period when the mental confusion begins to endanger the pilot and the mission. As the pilot begins to experience heat stroke, he/she may experience a loss of hand-eye coordination, difficulty with thinking and a loss of situation awareness. "Heat stress brought on by dehydration has an enormous effect on people's performance and can have a catastrophic effect on the mission," warn Rock and Latimer. Once a pilot begins to experience heat stroke, he/she will next become comatose unless he/she receives treatment immediately.

How can a pilot protect him/herself from the dangers of dehydration? Start by taking the following steps:

- Drink cool (40° F) water (don't believe the theory that lukewarm water is absorbed faster into the system). Drink to quench your thirst - then drink some more.
- Carry a container with you on a flight so you can measure daily water intake.
- Drinking water gradually throughout the day maintains proper hydration more than drinking a large amount of water once or twice a day. Gradual intake allows for absorption in body and helps maintain proper balance.
- Don't rely on the thirst sensation as an alarm...stay ahead. It often fails to kick in until the body is approaching a danger point.
- Limit your daily intake of caffeine and alcohol (both are diuretics and stimulate increased production of urine)
- Avoid fruit juices or non-diet soft drinks. Sugar can aggravate dehydration and cause bloating and cramps.
- Monitor your work activity. If you

feel light-headed or dizzy, let your crew and commanding officer know. If you suspect you are suffering from heat stress, see a physician before flying.

And remember:

- Acclimation to a major change in weather takes one to two weeks. Getting acclimated to the heat means you need more water because your body sweats more "efficiently".
- In extreme heat conditions, salt and electrolyte loss is a factor but not for the average person with a moderate exercise program. The American diet usually takes care of the loss. Adding sports drinks formulated especially to replace electrolyte loss may be a solution if electrolyte loss is too great.
- As body temperature rises, muscles fatigue sooner and performance declines by 20-50 per cent.
- If dehydrated, you are likely to feel stressed out, unduly fatigued, and lethargic. You may also feel headachy, dizzy, and nauseated and not feel much better the following day.

Adapted from information provided by Newton Wellesley Primary Care 2000, MA, USA and Spring 2000 Federal Air Surgeon's Medical Bulletin, "Dehydration and the Pilot", Rogers V. Shaw, II

The summer months can be safe and productive months if pilots take special care to keep themselves and their crew hydrated. But if a pilot becomes careless, forgets the water and remains in the "oven" too long, there is a good chance that someone just might get burned!



SSgt Mike Goff, a fire fighter with the 86th Civil Engineering Group, Fire Protection Flight, Ramstein Air Base, Germany, takes a rest from the heat during a simulated terrorist attack as part of an Anti-Terrorism/Force Protection on Ramstein Air Base, June 25, 2002.

Photo by SSgt Ken Bergmann



“Oh, Say Can You See?”

Eye Safety, Fireworks and The Fourth of July

By P.S. Harris

Celebrating our nation’s liberty every Fourth of July with fireworks is a tradition we all cherish. Communities everywhere have spectacular and colorful “bombs bursting in air.” Yet that tradition could cost you your most important asset as a pilot – your eyesight.

According to Prevent Blindness America, there were approximately 2,000 fireworks-related eye injuries in the United States in 2000. More than three-quarters of fireworks-related eye injuries occur during the Fourth of July holiday. The American Academy of Ophthalmology says that about one-third of those resulted in permanent eye damage and one fourth resulted in permanent eye loss or legal blindness. One in ten required the removal of the eye.

Ongoing studies by the United States Eye Injury Registry confirm that:

- 1 Three-quarters of all injuries are to males.
- 2 Nearly half of those injured are bystanders.
- 3 People under 20 years are nearly five times more likely to sustain fireworks-related injuries than those over 24 years.
- 4 The single most dangerous type of firework is bottle rockets which account for 67% of reported cases each year.



According to James Gigantelli of the University of Missouri Medical Center, the actual numbers may be even higher because ophthalmologists often do not see less severe injuries.

To protect your eyes this Fourth of July, follow these tips from the **American Academy of Ophthalmology**:

- 1 Attend only professional fireworks displays. They are safer and more spectacular.

If you must use fireworks at home:

- 2 Legal fireworks carry the name of the manufacturer, the words “Class C Common Fireworks,” and a warning label. If these are missing, you should consider them illegal and extremely unsafe.
- 3 Always use safety eyewear when lighting fireworks. Even spectators should consider wearing eyewear.
- 4 Never wear loose clothing when using fireworks.
- 5 Light fireworks outdoors in a clear area away from houses, dry leaves and grass and flammable materials.
- 6 Never put fireworks in breakable containers like tin cans, clay pots or bottles. These can shatter under the impact and scatter fragments similar to those associated with landmines.

And if you do suffer an eye injury:

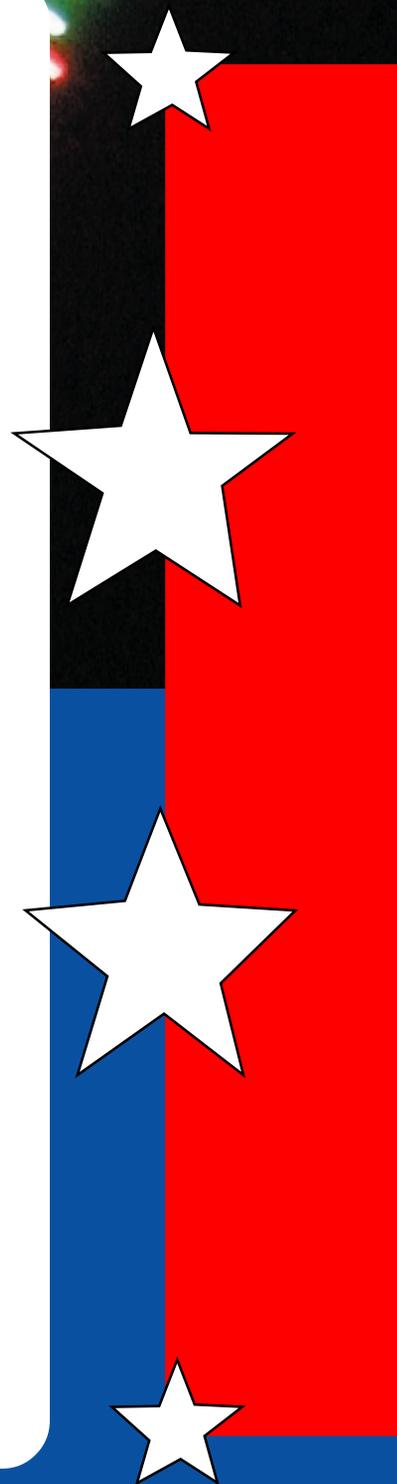
- 7 Do not delay medical attention for seemingly mild injuries. “Mildly” damaged areas can worsen and end in

serious vision loss - even blindness - that might not have happened with immediate treatment.

- 8 Do not rub the eye. If any eye tissue is torn, rubbing might push out the eye’s contents and cause more damage.
- 9 Do not attempt to rinse out the eye. This can be more damaging than rubbing.
- 10 Shield the eye from pressure. Tape the bottom of a foam cup, milk carton or similar shield against the bones surrounding the eye: the brow, cheek and the bridge of the nose.
- 11 Avoid giving aspirin or ibuprofen. They thin the blood and might increase bleeding.
- 12 Do not apply ointment or any medication. The ointment is probably not sterile and can make the eye grow slippery – slowing the doctor’s examination.

“An eye injury can be a life-altering event,” says Dennis Han, MD, Professor of Ophthalmology and Chief of Vitreoretinal Surgery at the Froedtert and Medical College Eye Institute. “Losing your sight is a devastating price to pay for a few minutes of fun with fireworks.”

Remember to use and view fireworks safely this Fourth of July and you will be able to see the “rocket’s red glare” for many years to come.



South Pole Emergency Airdrop and Aeromedical Evacuation for Dr. Jerri Nielsen

Airdrop

Among the 31 men and 10 women assigned to the Amundsen-Scott South Pole Station in 1999 was a 47-year-old female medical doctor who, in mid-June, discovered a potentially cancerous lump in her breast. Although her identity was not initially disclosed, the person was Jerri Nielsen, originally from Youngstown, Ohio. Nielsen, who began her assignment in February 1999, was employed by Antarctic Support Services, a company that provided a wide range of services for the National Science Foundation. The doctor found the lump at the height of the Antarctic winter, which lasts from February to October. As the only medical doctor at the South Pole, Nielsen managed the compound's small hospital. She dispensed medicine, took an occasional X-ray, and helped the staff deal with the disorientation, insomnia, and feelings of isolation that sometimes occurred at the remotest place on earth. She had once mused in an e-mail to friends: "I'm responsible for everyone's mental health, and the general morale for the station usually falls on my shoulders."

Dr. Nielsen conferred with some of America's best cancer specialists through the South Pole Station's satellite communications link. Much more was required, however, so efforts began to help Dr. Nielsen conduct a regimen of self-treatment until she could be airlifted from the South Pole. She was likely to benefit from the breast-cancer drug tamoxifen or intravenous chemotherapy that could shrink the tumor or cause it to stop growing altogether. The question, of course, was how to deliver a package of medications. Temperatures often dip as low as minus 100 degrees Fahrenheit at the South Pole during the Antarctic winter. Around-the-clock darkness covered the celestial sky, and crosswinds typically raged at 60 miles per hour. The exceptionally cold temperatures, the most frigid on earth, could paralyze an aircraft's hydraulic systems, crystallize the fuel, and turn lubricants into a jelly-like mush. High-velocity winds of hurricane force created blizzard conditions and reduced

visibility to zero. All of these unusual weather conditions made it impossible for an aircraft to land at the South Pole during the winter season.

Since a LC-130 airland mission could not be performed before October, the National Science Foundation asked the Air Mobility Command to make an extraordinary, out-of-cycle, mid-winter airdrop of medical supplies at the South Pole Station. The NSF paid for the mission at the Special Assignment Airlift Mission rate established for non-government, DoD users. There had been only three emergency medical airdrops at the South Pole in 25 years, so dangerous was flying to the South Pole in the middle of the Antarctic winter. The 780-nautical-mile distance to the South Pole from McMurdo Station was too far for the turbo-prop LC-130s, which could not be air refueled. Only an air refuelable jet transport aircraft possessed the capabilities to fly the mission the National Science Foundation so urgently required. Responsibility for the operation fell to the 62d Airlift Wing, McChord Air Force Base, Washington, whose 4th Airlift Squadron and the 8th Airlift Squadron were the only Air Force units responsible for Antarctic operations with C-141 aircraft in 1999. The wing's third squadron, the 7th Airlift Squadron, was scheduled to operate C-17s after the retirement of McChord's C-141s, and it began receiving C-17s in July 1999.

An aircrew of 22 officers and airmen drawn from the 62d Airlift Wing and the 446th Airlift Wing, an Air Force Reserve Associate unit at McChord, was handpicked to fly the dangerous, difficult mission. The aircrew included five pilots, four navigators, eight loadmasters, four flight engineers, and one flight surgeon. Including the physician was a precautionary measure, in case any of the crewmembers developed hypothermia when the C-141's two "troop" side doors were opened to drop the bundles.

The C-141 departed McChord at 10 a.m. Pacific Standard Time on Thursday, 8 July. On the sortie to the South Pole, the Starlifter and a supporting KC-10 from the 60th Airlift Wing, Travis Air Force Base, California,

would operate from Christchurch International Airport, the usual launch point for AMC aircraft going to Antarctica. The KC-10 would refuel the Starlifter en route to the South Pole. The tanker also left the CONUS for Christchurch International Airport on 8 July. Both aircraft proceeded to Hickam Air Force Base, Hawaii, for an en route stop on 9 July before continuing on to Christchurch. Midway on the 10-hour flight from the Aloha State to New Zealand, a KC-135 from the Hawaii Air National Guard refueled the C-141 with 70,000 pounds of fuel.

The 4,200 nautical-mile round-trip flight from Christchurch International Airport to the South Pole was planned for Sunday, 11 July. The aircraft launched from Christchurch to the South Pole at 1000 local as scheduled. The six and one-half-hour mission proceeded as planned. When 450 miles from the South Pole, the Travis KC-10 refueled the Starlifter with 75,000 pounds of fuel at 23,000 feet. To help the crew find the drop zone, personnel at South Pole Station constructed 27 smudge pots, using barrels, wood, and gasoline. The pots were arranged in a "C" pattern and set ablaze to outline the drop zone laid out on a 3,000-foot section of the summer skiway, which the Air National Guard ski-equipped LC-130s used when resupplying South Pole Station. By the time the C-141 neared its destination, driving snow had reduced visibility to less than five miles. Crewmembers donned night vision goggles to help them see through the dense fog and heavy Antarctic darkness. About 30 miles from the South Pole, the aircrew spotted the first glimmers of the signal fires. All of the lights inside and outside the South Pole compound had been extinguished, so the pilots would not mistake them for the illuminated drop zone. The communication systems, data links, and other pieces of scientific equipment at the South Pole were among the most sophisticated in the world. It is ironic, then, that in the final moments of the approach, it was the blazing smudge pots of a type burned since ancient times that guided the Starlifter safely to the drop zone.

Normally, airdrops were made from C-141s through the hydraulically actuated petal

doors at the rear of the aircraft, but for this mid-winter Antarctic airdrop, the aircraft's two side troop-exit doors were used. The reason was simply that the extreme cold was likely to freeze up the hydraulics that operated the rear petal doors, thus preventing them from being closed. Crewmembers could not survive exposure to the subzero temperatures for very long, even though they wore the full panoply of polar clothing: parkas, mukluks, mittens, face masks, Russian-style caps, padded overalls, and thermal underwear. The South Pole is nearly 10,000 feet above sea level. The freezing Antarctic air is so thin, cold, and debilitating that the crew donned oxygen masks before the loadmasters opened the troop exit doors. All these extraordinary circumstances prompted Lieutenant Colonel John Pray, deputy commander of the active-duty 62d Operations Group and the mission commander, to describe the airdrop as "the most challenging mission we've ever attempted in peacetime."

Crewmembers used grid navigation, inertial navigation, and night vision goggles to find the Amundsen-Scott Station, which they reached at about 1630 local on the 11th. The aircraft made two passes over the drop zone, as spotters watched from the highest structures around the station. The loadmasters rolled out two bundles on the first pass and four bundles on the second pass, as the aircraft swooped over the compound at 170 knots (200 mph) and at an altitude of only 700 feet. Each time over

target, the loadmasters had just 12 seconds to push out the parcels. Temperature in the aircraft plummeted quickly to minus 60 degrees, but it was even colder for the loadmasters who, stationed at the doors, were hammered by powerful, direct blasts of the Antarctic wind. The airdrop occurred in total darkness, for during winter in Antarctica, the sun never shines at the South



Members of the 62nd Air Wing, McChord Air Force Base, Wa., remove aircraft equipment to lessen weight prior to the installation of the Tucker System on an Air Force C-141 aircraft at Christchurch International Airport, New Zealand. The Tucker System is a series of specialized rollers that enable cargo to be air-dropped out of the troop doors of the C-141. A crew is conducting a humanitarian mid-winter air drop mission to Amundsen-Scott South Pole Station, in which the C-141 will be used to drop critical medical supplies to a member of the National Science Foundation at the South Pole who has been diagnosed with cancer.

Pole. Smoke from the smudge pots partially obscured the drop zone, making the loadmasters' work even more difficult.

Four bundles contained cancer medications, diagnostic equipment, video-conferencing gear, and an ultrasound scanner. One parcel bulged with mail, fresh fruit, and vegetables. Carefully tucked inside the food package was a dozen roses, a symbol of encouragement, cheer, and goodwill for Dr. Nielsen. Each bundle weighed approximately 350 pounds. The six

packages were fitted with strobe lights to help the men and women on the ground locate the cargoes. Immediately after the second pass had been completed, South Pole personnel rushed from the compound to retrieve the bundles. The minus 86-degree ground temperature snuffed out the strobe lights. It took about seven minutes to corral five of the parcels, but another one and a-half hours was needed to find the sixth bundle. The parachutes on five of the packages opened, but the parachute on the sixth bundle, containing the ultrasound scanner, failed to deploy. The package crashed onto the ice. The scanner was destroyed.

The airdrop completed, another six hours was needed for the C-141 to return to Christchurch. After refueling at Christchurch International Airport, the C-141 flew for another five hours to Pago Pago, American Samoa, for an overnight stop. The next stop was Hickam Air Force Base where the crew remained overnight before beginning the final leg back to McChord. The C-141 crew arrived back at McChord on 15 July after having logged

nearly 50 flying hours on a mission that garnered international attention and much praise for the competency and professionalism of Air Mobility Command's total force team. General Charles T. Robertson, Jr., AMC Commander, spoke for all those associated with the operation when, on one congratulatory letter, he penned, "... a truly heroic effort!"

...to be continued in the September/October issue of The Mobility Forum.



C-141B

The AMC “Workhorse”- The Starlifter fulfills the vast spectrum of airlift requirements through its ability to airlift combat forces over long distances, either by air, land or airdrop.

S T A R L I F T E R



The **C-141B** is a “stretched” **C-141A** with in-flight refueling capability. The stretching of the Starlifter consisted of lengthening the plane 23 feet 4 inches. The added length increased the C-141 cargo capacity by about one-third. The development of the B model was the most cost-effective method of increasing AMC’s airlift capability.

Primary Function: Cargo and troop transport **Thrust:** 20,250 pounds, each engine **Wingspan:** 160 feet **Length:** 168 feet, 4 inches **Height:** 39 feet, 3 inches **Speed:** 500 mph (Mach 0.74) at 25,000 feet **Ceiling:** 41,000 feet at cruising speed **Range:** Unlimited with in-flight refueling **Maximum Takeoff Weight:** 323,100 lbs **Crew:** Five or six: two pilots, two flight engineers, one loadmaster and one navigator (added for airdrops). Aeromedical teams of two flight nurses and three medical technicians each are added for aeromedical evacuation missions.



A paratrooper from 1-508 INFABN BN being treated by medical personnel for heat exhaustion during Airborne Operations conducted by the 173rd Airborne Brigade at Vitina Drop Zone, in Kosovo. The soldiers were in Kosovo in support of Operation Joint Guardian II.

Photo by Staff Sgt. Jonnie Wright



The Heat Is On

By Moira K. Wiley

With summer in the air, it's time for a season full of fun in the sun. While many Americans head outdoors to enjoy a variety of activities such as camping, grilling, swimming, cycling, gardening or beach combing, intense heat, compounded by stifling humidity could pose potentially life-threatening consequences. Many states, especially those in the south, experience extremely high temperatures during the summer each year. Some may even experience record high heat waves that could pose an even greater threat to human life. This threat comes in many packages, including sunburn, heat cramps, heat exhaustion and heatstroke.

Each year more people in the United States die from extreme heat exposure than from hurricanes, lightning, tornadoes, floods and earthquakes combined, according to the Centers for Disease Control and Prevention (CDC). Between 1979 and 1998, a total of 7,421 deaths were attributed to excessive heat exposure in America. On average, approximately 300 people die each year from exposure to heat.

Texas and other southern states have the highest rates of heat illnesses and deaths, but such deaths can occur nearly anywhere. According to the CDC, about 240 people in the United States die from heat illnesses each year. During heat waves, this number has risen to as high

as 1,700. In the summer of 1995, seven people died of heatstroke in Texas alone and in July of that same year, according to a report in *New England Journal of Medicine*, a four-day period of extreme heat resulted in or contributed to the death of more than 700 residents of Chicago.

When Summertime Gets Too Hot to Handle: Who's at Risk?

It's not surprising that like many illnesses, heat-related illnesses tend to affect certain types of people more so than others. These people include the young, especially those under the age of two; older adults, especially those taking medications to regulate blood pressure or treat diabetes or heart disease; and those suffering from certain medical conditions such as obesity, sweat gland disease, diabetes, dehydration, malnutrition, low blood pressure and heart disease. Victims of heat-related illnesses also tend to fall ill while outdoors due to overexposure to the sun and the resulting higher temperature that may accompany it. However, the results from too much heat can also be felt indoors. For example, on the morning of July 7, 1996, a 74-year-old woman was found dead under her kitchen table in Fort Worth, Texas. A victim of heatstroke, the woman died not because of overexposure to the sun, but due to high temperatures in her own home. To save money on her electric bill, the woman had not turned on her air conditioner and was

only using a single fan to cool her house. The temperature inside the house was over 100 degrees.

Many fall victim while involved in some form of outdoor activity. Again, these victims are typically in specific age brackets or have certain health conditions that put them at higher risk; however, some victims of exertional heatstroke might come as a surprise. These victims are usually young, otherwise healthy people, such as runners and football players. Take for example, the heat-related deaths of Minnesota Vikings offensive lineman Korey Stringer on July 30, 2001, and University of Florida incoming freshman fullback Eraste Autin just five days prior.

Stringer, a 27-year-old offensive tackle collapsed from heatstroke on the second day of pre-season practice. Temperatures the day of his death reached the mid-90s coupled with a heat index of 109 degrees. Stringer's body temperature rose to 108 degrees and he died 15 hours later at the hospital, never regaining consciousness. He was the first professional football player to die from heatstroke in the National Football League's history, however high school and college level players have fallen victim to overexertion in the heat during training in the past.

The latest victim, 18-year-old Autin, collapsed at training camp and died

following a six-day coma from which he never awoke. It was reported that Autin didn't complain of any pain or show any visible signs of distress before collapsing while jogging to the locker room following a voluntary summer conditioning session with teammates. It was his 10th workout of the summer with a temperature of 88 degrees and 72 percent humidity, both of which are considered normal summertime weather conditions for Florida. According to the St. Petersburg Times, Dr. Fred Mueller of the University of North Carolina's sports medicine department said Autin was the 18th high school and college football player since 1995 to die from heatstroke. These included four in 2000, two in 1999, three in 1998, one in 1997, two in 1996 and five in 1995. The victims ranged in age from 13 to 26 with temperatures the day of their collapses ranging from 77 to over 100 degrees.

According to an article written by Rebecca Williams for *FDA Consumer Magazine*, exertional heatstroke has long been studied by the military. She provides as her example, the U.S. Marines at Parris Island, South Carolina, who have studied heat illness among new recruits finding that even though soldiers train in the early morning and are required to drink lots of water, as many as two percent of them will suffer heat illnesses during the summer months, and about one percent in the winter. They also found that the risk of exertional heat injuries depends on the heat and humidity, the soldier's fitness level and whether or not the person is accustomed to hot weather.

Sunscreen: The Burning Facts

Baked, not fried, is a good idea when spending long hours in the sun. While sunshine has certain health benefits, too much sun can become a potential danger and prolonged exposure can cause sunburn. Burning should be avoided not only because it damages the skin, but because it also can have more adverse affects. Although the discomfort is usually minor and healing often occurs in about a week, a more severe sunburn

may require medical attention. Symptoms of sunburn are well known and can include the skin becoming red, painful and abnormally warm after exposure. In severe cases, however, swelling of skin, blisters, fever and headaches can also occur. Permanent conditions of sun exposure can include sunspots, wrinkles, premature aging, and even skin cancer.

Common first aid includes ointments for mild cases, even if blisters appear, but are not broken. Blisters should never intentionally be broken, however, if breaking does occur, dry sterile dressing may be applied. A cold compress can also be applied or the sunburned area can be immersed in cool water. Serious, extensive sunburn cases may require medical

...heat-related illnesses, including heatstroke, are entirely preventable.

attention and when in doubt, a physician should be consulted.

To avoid sunburn risk, limit outdoor activity during the hottest part of the day or stay in the shade as much as possible, if being out during this time can't be avoided. Wearing a wide-brimmed hat can also provide some shade and protection from the sun and there are a variety of sunscreens available. Sunscreens contain a sun protection factor (SPF) that varies and is based on Food & Drug Administration regulations. SPF ranges from those providing minimum protection ranging from SPF 2 to 12, moderate protection ranging from SPF 12 to 30 and high protection of SPF 30+. The most effective products say "broad spectrum" or "UVA/UVB protection" on their labels.

Muscle Spasm or Heat Cramps

Although heat cramps are the most common and least severe of heat-related illnesses, they can still be an early signal that the body is having trouble with the heat. According to the U.S. Department of Health and Human Services, heat cramps are painful spasms of the muscles

that occur among those who sweat profusely in heat and drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly thereafter, the lowered salt level in the muscles causes painful cramps. The affected muscles can include those in the arms, legs and abdomen, but any tired muscles, especially those used while working or exercising, are usually the ones most susceptible.

According to the American Red Cross, to treat a person suffering from heat cramps, they should be moved to a cooler place and rest in a comfortable position. They should lightly stretch the affected muscles and replenish fluids. Firm pressure on cramping muscles, or a gentle massage, could also relieve spasms. Victims should sip cool water, about a half glass every 15 minutes; however discontinue use, if nausea occurs.

Liquids with alcohol or caffeine should not be administered, as they can make conditions worse.

Take Five: Heat Exhaustion Threat

The result of heat exhaustion is a form of mild shock and, if left untreated, can progress to heatstroke, which can be deadly. The important thing when treating heat exhaustion, like heatstroke, is speed. The faster the victim is cooled and re-hydrated, the better their chance for survival. Heat exhaustion typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. It can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids, or it can occur swiftly.

Heat exhaustion includes several clinical disorders with symptoms that may resemble the early symptoms of heatstroke. The early warning signs of heat exhaustion include heavy sweating, paleness, muscle cramps, tiredness or fatigue, weakness, dizziness, headache, nausea or vomiting, or fainting. The

victim's skin may be cool and moist, pulse rate will be fast and weak and breathing will be fast and shallow. Medical attention should be sought immediately if symptoms are severe, the victim has heart problems or high blood pressure or symptoms worsen or last longer than one hour. Otherwise, a person suffering from heat exhaustion should be moved out of the heat and taken to a cooler place. Fan or move the victim to air-conditioned room, if possible. Remove or loosen tight or restrictive clothing and apply cool, wet cloths, such as towels or sheets. If the person is conscious, give cool water to drink, making sure the person drinks slowly, about a half glass every 15 minutes. Make sure the victim rests in a comfortable position, while watching carefully for changes in their condition.

Extreme Danger: Heatstroke

Heatstroke is life threatening! Even short periods of high temperatures can cause serious health problems. Heatstroke, sometimes referred to as sunstroke, occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails and the body is unable to cool down. Body temperature may rise to 106 degrees or higher in as little as 10 to 15 minutes leading to death or a permanent disability, if emergency treatment is not provided.

Warning signs of heatstroke are sometimes mistaken for heat exhaustion, a less dangerous heat-related illness, so victims do not always receive the treatment they need immediately. Signs of heatstroke vary, but may include an extremely high body temperature, typically above 103 degrees; red or spotted, hot, usually dry skin with no sweating; rapid, strong pulse; throbbing headache; dizziness; nausea; confusion or delirium; convulsions; and unconsciousness.

Heatstroke is a severe medical emergency and delay in treatment can be fatal, says the American Red Cross. Emergency medical assistance should be summoned immediately or the victim should be taken to the nearest hospital. In the meantime, the American Red Cross suggests using

extreme caution in moving the victim to a cooler environment and reducing body temperature with a cold bath or sponging. Clothing should be removed and fans and air conditioners should be used to help aid in cooling the body. Fluids should not be administered, especially if the victim is vomiting or there are changes in the level of consciousness.

Beat the Heat: Stay Cool & Spell Relief W-A-T-E-R

Prolonged periods of excessive heat and humidity are considered a heat wave. The National Weather Service will issue alerts to warn the public during these periods. Not only is the actual temperature taken into consideration during a heat wave, but

Heatstroke is a severe medical emergency and delay in treatment can be fatal...

also the heat index, which is the number in degrees that tells how hot it really feels when relative humidity is added to the actual air temperature. According to the American Red Cross, exposure to full sunshine can increase the heat index by 15 degrees.

If a heat wave is predicted or currently in progress, people should slow down and avoid strenuous activity. Strenuous activities should be reduced, eliminated or rescheduled until it's cooler. If strenuous activity cannot be avoided, it should be done during the coolest part of the day, which is usually in the morning between 4 and 7 a.m.

Stay indoors, preferably somewhere with air conditioning, as much as possible. If air conditioning is not available, stay on the lowest floor, out of the sunshine. Take cool baths, spray yourself with water frequently and sit in front of an electric fan as much as possible. Individuals at higher risk of heat-related illnesses should stay in the coolest available place, which may not necessarily be indoors, especially if air conditioning is not available. Spending more time in air-conditioned places, however, can markedly

reduce danger from the heat.

Dress for summer by wearing lightweight, light-colored clothing. This type of clothing reflects heat and sunlight and helps the body maintain normal temperatures. Wearing loose clothing can also help by allowing room for sweat to evaporate.

Put less fuel on your inner fires by eating smaller meals and eating more often. Foods high in protein, which increase metabolic heat also increase water loss and should be avoided. Salt tablets should also be avoided, unless directed to take them by a physician.

One of the most important safety tips, however, is to drink plenty of fluids regularly and often, even if you don't feel thirsty.

Water is the safest liquid to drink during heat emergencies. Drinks with alcohol and caffeine in them should be avoided, as they can cause a person to dehydrate even more. Although they can make a person feel better briefly, they make the heat's effect on the body worse. This is especially true of beer, which can severely dehydrate the body. Thus, making sunbathing with a six-pack of your favorite brew at your side an unwise decision.

Brave the Heat, Without Frying Your Brain

According to many experts, heat-related illnesses, including heatstroke, are entirely preventable. If someone is overheating, however, it can become life threatening and a person only has minutes to do something about it.

The warm breeze that signals the arrival of summer doesn't also have to signal a season of fear or fatalities. The period between the weekend before Memorial Day and lasting through Labor Day is supposed to be filled with fun in the sun, the feel of sand between your toes, the smell of backyard barbecues, the sound of splashing water at the lake or pool or any number of other things associated with your favorite outdoor activity. If you take the proper precautions and keep on the lookout for early warning signs of trouble, each day's first rays of sunshine will mark another day filled with summer escapades.

101 Critical Days of Summer

The period between Memorial Day and Labor Day is a period of increased off-duty injuries caused by increased activity and risk taking. People taking advantage of summer weather for sports and recreational activities, and hitting the road for vacations cause the elevated mishap rate. Over the last five years, the Air Force has lost an average of 21 members during summer.

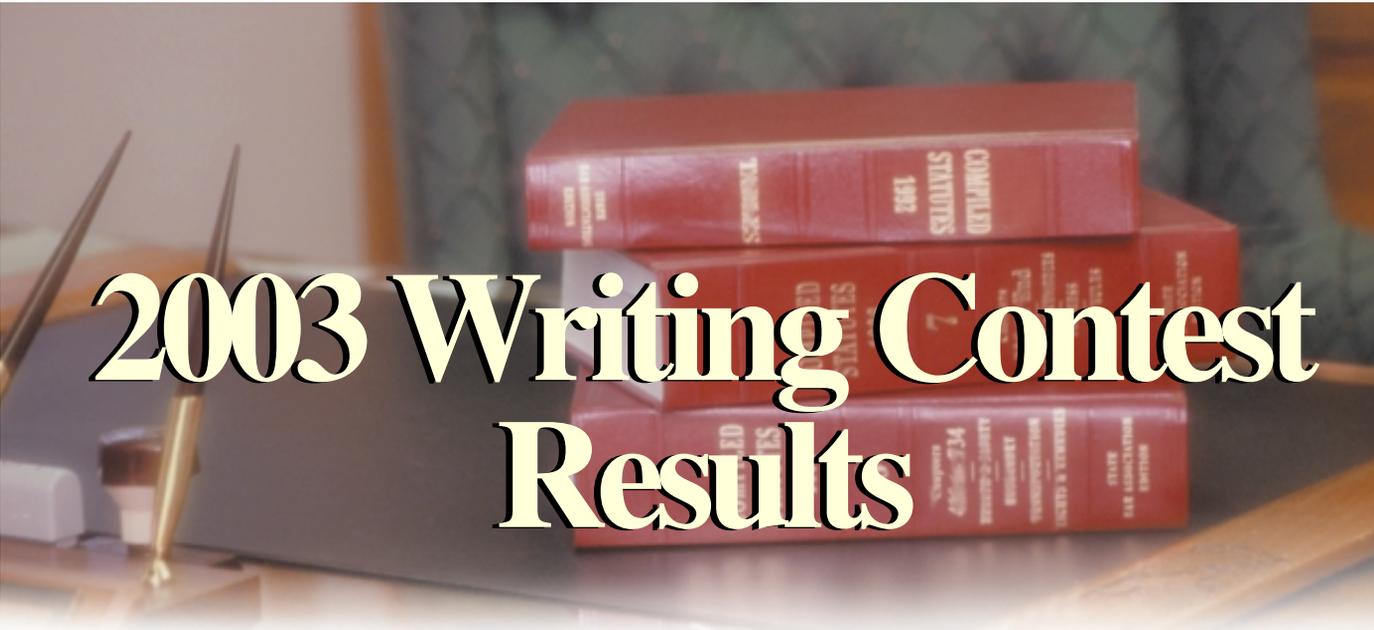
Safety officials offer the following factors to consider when planning summer travel:

- **Wear seatbelts.**
- **Remain alert while at the wheel and plan rest breaks at frequent intervals.**
- **Don't speed in an effort to arrive early, it is better to arrive late than not arrive at all.**
- **Don't drink alcohol and drive.**

Anticipate the unexpected and be ready to react.

“Our focus during this historically hazardous period must be united, personal and direct. Look at our recent success in the war on terrorism. The same mindset of success can be just as effective with this summer’s safety campaign. Let’s celebrate our success and survive the summer!”

Gen. John W. Handy, Commander Air Mobility Command and U.S. Transportation Command, commenting on the 101 Critical Days of Summer



2003 Writing Contest Results

First Place

“CRM: A Case Study”

Retired Lt Col J. Norman Komich

Featured in this issue

Second Place

“The Long Journey Home”

MSgt Marc Effan
615 AMOG/SE
Travis AFB, CA

Third Place

“Airlift: Making It Happen”

MSgt Carlos D. Cisneros
9th Airlift Squadron
Dover, DE

Honorable Mention

“OPERATION MARKET: The Aircrew”
CMSgt Karl Hinkamp
86th Operations Group
Ramstein Air Base, Germany

CRM: A Case Study

By: J. Norman Komich

It began as an uneventful two day trip on the 737, four legs each day, with the second day itinerary being a first leg into the hub, an “out and back” from and back to the hub and then a deadhead home on the last leg. However, the First Officer was coming down with a cold and by the second day, he was clogged up enough on the first leg to send a message to operations that he needed to be replaced upon our arrival at the hub. Ops responded that they would find a replacement for him and they set him up to deadhead home. According to our contract, “Short Reserve” pilots are supposed to be “located within 90 minutes” of the airport and we had called Ops three hours before the second leg was to depart. Consequently, when that departure time came and went and there was still no replacement First Officer, I called scheduling and was told “He’s in the parking lot; it won’t be long now.” Having been “quick called” myself on a number of occasions, I was acutely aware of all the impediments one can encounter when rushing to the airport: traffic congestion, red lights, just missing the crew bus from the parking lot, etc., and so I made an appropriate announcement to the passengers and then sat back in my cockpit seat and waited.

As I sat there waiting, I contemplated the First Officer’s arrival in the context of how I would have arrived: a sweaty individual rushing into the cockpit while profusely

apologizing for the delay. That was not the case as my first indication that our First Officer had finally arrived was the flight attendant stating “So there you are!” However, this was *not* followed by his rushed entry into the cockpit. Instead, he stopped in the galley area and began a rather lengthy discussion with the flight attendants in which he lamented that he was on his last day of availability on reserve and as a commuter to the base, he had planned to be going home about this time. Instead, he had been “bagged” by scheduling to cover this out and back and that would force him to miss the flight he had planned on taking home. He would have to wait till nightfall to take the last flight of the day and that would get him home seven hours later than he had expected. As a former “commuter”, I again sympathized with his plight but as you shall see I did not get an immediate opportunity to express much sympathy.

When he finally stopped his dialogue with the flight attendants, he entered the cockpit without saying so much as one word to me or even looking in my direction and he proceeded to stow his flight bag beside his seat. Without getting too mundane here, let me describe what I was confronted with. He was a rather large and intimidating figure and the cockpit of the 737 is not that large, so as he bent over to stow his bag and adjust his seat, he provided me with a very close up view of his backside. This took more than a few seconds and still

without a word or glance in my direction, he got into the seat and began a very methodical preflight of his side of the cockpit.

Now let me tell you that I have taught CRM for many years and I have prided myself in “getting along” with everyone that I have flown with. But this rude performance was beginning to get to me. After all, I was the Captain and to not even get a “Hi, how’s it goin’?” from this individual had me concerned over what I was facing on the next two legs. I have always attempted to address any potential problems on the ground where there are a lot more options before getting into the air where there are far fewer options available. As he continued with his methodical preflight, my immediate reaction was to begin to be concerned over whether or not this individual was going to be able to function effectively enough to remain on the crew. I had never even come close to replacing a First Officer before, but neither had I ever been confronted with this type of attitude. He was making it perfectly clear that he was not a happy camper to be quick called out and since the company had inconvenienced him, he was in turn going to inconvenience the company and me by taking his sweet time. So as he dilly-dallied along, my blood pressure was slowly increasing and I was vacillating between having him replaced and attempting to salvage the situation.

At this juncture, I would like to ask you the reader to stop reading for a moment and formulate what you would have done had you been in this situation.

The issues that were running through my mind were as follows: If I let him get away with this, I’ll have no control over him for the next two legs, so as the Pilot in Command, I need to exercise my authority and say something about his attitude. However, if I do say something to him, since he is already disgruntled, my saying something to him will probably only make him more disgruntled and what will that achieve? Additionally, if I have him removed, it will be a black mark on his record and it will delay an already late flight that much longer.

While I was attempting to come up with a game plan of how to respond to this, fate interceded and provided me with a solution.

As he slowly finished his preflight, he eventually got to the paperwork on the center pedestal, which he picked up and perused for an extensive time. When he was finished, his eyes left the paperwork and FINALLY looked at me. At this point I was still debating what my first words to him would be. The paperwork lists me by my first name “John” and as our eyes met, he condescendingly said “And you must be John.” His attitude was continuing to come through loud and clear. However, by nature, I hope I’m considered by others to be a somewhat nice person and here is where fate stepped in. Instead of responding with some preconceived speech, to “put him in his place”, my natural response took over and I simply extended my right hand and said “I go by Norm.” I sensed that he did not expect that kind of cordial response as he shook my hand and told me his name.

In that moment, I decided to play ALL my CRM trump cards and show that one does not necessarily lose his leadership capabilities by being nice. (Remember the old adage: “You get far more flies with honey than you do with manure!”) I knew he was miffed about not making his flight home, so I decided to show that I was not the enemy but rather an ally and I said “I heard you say you’ll miss your flight home but if we really hustle, you might still make it. Do you want the leg over or the leg back?”

This time his body language actually revealed that he was not prepared for someone who would respond to his disgruntled behavior with a choice and he paused and actually squirmed in the seat before saying “Well, I guess I’ll take it over and you can bring it back.” As I write this, I realize there is some sort of a religious parable in here somewhere but the point I want to make is that there is more than one way to skin the proverbial cat. The goal at that moment was a safe and timely trip over and back. CRM teaches us that we should all get along and work together as a team, and that’s easy to do when everyone is playing from the same sheet of music. But when someone brings in a personal agenda as this individual did, it can be a far different situation as it was in this case. I will explain why he was so disgruntled in a moment. It was obvious that he had gone

out of his way to delay the flight. In some way, I think he would have enjoyed a confrontation but my courteous response didn’t give him the opportunity. In fact, not only did I not confront him, I was attempting to assist him and there was little for him to do under those circumstances than to simply do his job. And that’s exactly what he did.

On his leg from the hub, he did a very commendable job of flying: good stick and rudder skills and he followed standard operating procedures to the letter. Once we got to cruise altitude, we got to talking and that was when I learned that he was being furloughed in 6 weeks and he had few prospects for another job. He was married with children and was obviously under a great deal of stress. If I had had him removed from the flight back at the gate, what would that have ultimately accomplished?

And when I reflected back on what transpired, I began to ask myself, how bad could it have really been? The weather was CAVU at both airports. And I began to wonder if perhaps what I really was concerned over was that I wasn’t getting enough of Aretha Franklin’s R-E-S-P-E-C-T. And then I asked myself “Exactly how much respect do I really need to have an effective crew?” Put another way, was it a true safety issue that I was worried about or just a personal ego issue on my part that he wasn’t subordinate enough to me?

One can command respect by demanding it solely “because I’m the Aircraft Commander!” or one can earn respect by being a compassionate leader. Managerial and leadership traits taught in CRM are typically very generic. For all the CRM training I had been taught and had taught, I was breaking virgin ground in my response to his attitude. My “natural” reaction worked out fine for everyone involved. I learned a great deal about leadership traits from this experience and I hope you did also from reading about it. And by the way, I put the pedal to the metal on the return trip and he did make that earlier flight home that he had originally planned on and we parted decent friends. What a contrast to what would have resulted if I had confronted him or replaced him.

FREEDOM OF NAVIGATION

by Dale Cheney
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Like most freedoms, it doesn't come free

Air Force Captain Mark Burgess was happy to be flying his last “down range” mission to Oman in the Persian Gulf before returning to Dover AFB, DE. As the Aircraft Commander of a Reserve C-5, he was pleased with the performance of his crew and felt good about the much-needed supplies they delivered to ground forces in the theater supporting OPERATION ENDURING FREEDOM. It had been a tough 10 days but after this run they would return to Rhein Main, pick up cargo and head for the East coast. With any luck he'd be home in time for his daughter's soccer tournament on Saturday.

The crew had long since settled into the predictable routine of long-haul flights as the largest of America's airlifters tracked down the center line of the Red Sea. The loadmasters had finished checking the tie-downs on this trip's load and were stretched out on pallets of blankets and tents. The flight engineers were discussing the relative merits of the “designated hitter” differences between the American and National baseball leagues. His co-pilot, Captain Hank “Hondo” McPherson, had flown the last leg and was in the back trying to get a reluctant microwave to heat the fried chicken he had carefully wrapped and placed in his helmet bag before leaving Frankfurt that morning.

Mark methodically scanned his



instrument panel noting that everything appeared normal. Even the temp gauge on #4, which had been reading a little high on the first leg, bounced comfortably within the green section of the tape. Ironically, Mark was looking at the Radar Warning Receiver (RWR) or “Raw gauge”, a threat warning device that signals when the aircraft is illuminated by fire control radar systems associated with fighter interceptors and air defense missile sites, when suddenly it indicated an airborne threat and its aural tone screeched in his headset.

Airlift aircraft had only recently been modified to include this equipment as the threat of surface-to-air missile system technology had proliferated to rogue states and non-state sponsored terrorist groups. This had to be another “false positive”

reading as he knew their course did not take them near anyone's national airspace. Sometimes a television or microwave tower would light up their RWR gear and get their attention but proving to be a false indication. On second thought, it would be very unusual for TV interference to be picked up this far off shore in this part of the world. He turned down the RWR volume just in time to hear:

“This is Yemen control, American aircraft 25 miles north-northwest of the straits of Bab El Mandeb, you are being intercepted by fighter aircraft from the Peoples Democratic Republic of Yemen. Follow their instructions to land. You have violated our sovereign airspace and must land immediately.”

It took Mark only a couple of seconds to

put it all together. "Load, tell Hondo to get back up here...now!" As Hondo scrambled back to his seat Mark scanned his three inertial navigation systems and GPS displays that confirmed they were about where he thought they should be...on flight plan, on course.

Before Hondo could confirm this, Mark looked out the left rear quarter panel window to see a MIG-21 fighter pass his left wing about 100 feet out and climb rapidly to bleed off his excessive overtake. When he had stabilized the fighter slightly ahead of and above the big airlifter's wing line, the fighter pilot executed a pronounced wing rock--the internationally accepted signal "you are being intercepted." Glancing at his RWR gear confirmed what Mark had suspected; this fighter's partner had stayed behind with radar and missiles locked onto the C-5. There would be no evading this encounter, no "correcting back to course" with profuse apologies to air traffic controllers for the "navigational error." Hondo broke into Mark's thought pattern with an excited voice: "Mark, we are exactly where we should be...we aren't in anybody's airspace...we are in international airspace twenty miles out from the international straits of Bab El Mandeb."

With a confidence he really didn't feel, but bolstered by his recent ground training session on the international airspace system and crew members' rights and responsibilities for operating there, Mark responded. "Yemen Control, we are an American military aircraft, call sign 'Hazen 21.' We are on our flight plan route in international airspace exercising our right of transit passage through the international straits. You have no jurisdiction or authority to divert this flight. Request you recall your fighters immediately."

Hondo couldn't believe what he was hearing. "Mark, are you crazy... these guys are armed...they could shoot us down!" Before he could say anything else, Mark held up his hand in a gesture to wait.

"Hazen 21 you are in Yemen Flight Information Region airspace and we have no record of your flight. Squawk Mode 3/2774 and Ident."

Mark replied, "Hazen 21, 2774 and Identing. We are in international airspace and choose not to participate in FIR services, which is our right. I request again, recall your fighters."

About 30 seconds later and without any further dialog with the controlling agency, the fighter that had been forward and left of the aircraft, climbed abruptly out of sight. After an anxious few seconds, the RWR scope went back to a blank screen. The intercept was over. Mark reached over and marked their position on the GPS then smiled at his co-pilot who was shaking his head and smiling, visibly relieved. Mark confirmed his response with the Foreign Clearance Guide, made the appropriate notations for the Situation Report he would write, and planned to phone the local US Embassy to report the experience upon landing.

Hypothetical...yes. Farfetched.... no. USAF crews with global mission responsibilities are exposed daily to the possibility of a nation's excessive claim of control over international airspace affecting their missions. The free and unencumbered use of international airspace is critical to global access and the execution and support of US military missions as well as international commerce.

Legal Considerations

It is not necessary to fly with a lawyer in your cockpit, but there are a couple of legal points relative to rights and requirements in international airspace that should be kept in mind. Numerous sources of law impact air law and law of the sea, but there are two of particular interest to aviators. The first is the 1944 Convention on International Civil Aviation (Chicago Convention) that spawned the International Civil Aviation Organization (ICAO). The second is the United Nations Convention on Law of the Sea (UNCLOS) of 1982. Despite general agreement among the community of nations with the provisions of these two conventions, there are still areas of the globe where nations disagree on the degree of control coastal nations can exert over the adjoining waters and airspace.

Chicago Convention

Designed to encourage the then-rapidly developing civil aviation industry, the Chicago Convention, which does not apply to state aircraft (defined to include military, police or customs aircraft), establishes, in conjunction with the more recent UNCLOS, useful legal tenants including the division of airspace into national and international airspace. Articles of the Convention prohibit the overflight of or landing on the

national territory of another nation without that nation's prior permission, except in emergency assistance situations, thereby codifying the legal concept that nation states exercise absolute sovereignty over their national airspace. The Convention also created the ICAO as a forum for adopting and promulgating standards and recommended practices (SARPs) for the conduct of international civil aviation. Even though the Convention does not legally apply to state aircraft, Air Force regulations require AF aircraft to operate, mission permitting, in accordance with the SARPs. All aircraft including state aircraft must exercise "due regard" for the safety of navigation of civil aircraft.¹

UNCLOS

The definitive UNCLOS agreement opened for signature on 10 December 1982. Almost 12 years later, it entered into force on 16 November 1994. The United States has not ratified the agreement, objecting to specific provisions of Part XI dealing with deep-sea mining. However, President Reagan stated in his US Oceans Policy Statement, 10 March 1983 that the US was prepared to accept and act in accordance with the balance of interests relating to the traditional uses of the ocean. The US agrees those provisions of UNCLOS reflect customary international law and are thus binding on all nations.

A key provision of UNCLOS is the establishment of 12 nautical miles as the seaward limit of a nation's territorial sea and, by extension, the end of national airspace and the beginning of international airspace. The baseline from which the 12 nautical mile limit is measured is generally the low water mark along the coast of a nation. For reasons of practicality, various formulas for straight baselines exist to accommodate nations with deeply indented coastlines or fringes of islands along the coast. Establishing the location of the baseline is important because all maritime and airspace zones are measured from it. Figure 1 (page 33) depicts the dimensions of various maritime zones (most of which are more important to mariners than airmen), but the operative division for aviators is the 12 NM division of national and international airspace.

All aircraft enjoy freedom of navigation and overflight in international airspace. Overflight is prohibited in national airspace without the permission of the nation, with

certain specific exceptions, such as when an aircraft is in international straits or archipelagic sea lanes, or when rendering assistance to those in danger of being lost at sea when the location of those in danger is reasonably well known.²

The United States, as well as many signatories to UNCLOS, does not always agree with how other nations--allies, neutrals and hostile countries alike--interpret some of the provisions of UNCLOS. Over time several nations have asserted claims that the US considers excessive. Examples include improperly drawn straight baselines (by which the asserting country attempts to enclose large amounts of the oceans as its internal waters) and claims of ownership over the waters of bays and gulfs based on spurious claims of historic control (such as Libya's claim to own the Gulf of Sidra). Some excessive claims can appear insidious such as limitations on the kinds, means of propulsion and number of ships or aircraft and cargo transiting through a country's maritime zones at one time and requirements to furnish prior notification and obtain approval before exercising the right of innocent passage. Also, territorial seas, contiguous zones, exclusive economic zones asserted in excess of those allowable under UNCLOS, and permanent security zones constitute excessive claims. Finally, some coastal states attempt to assert national control over portions of international straits and archipelagic sea-lanes that overlap their territorial waters despite the fact that UNCLOS specifically grants transit rights.

For airmen, the issue of excessive claims often arises with regard to Flight Information Regions, or FIRs. FIRs are defined areas of airspace within which flight information and alerting services are provided. FIRs are allocated to coastal states by the ICAO for the safety of civil aviation and encompass both national and international airspace. Coastal states like having FIRs for reasons of prestige and because they can charge flight service fees for their use.

As a matter of policy rooted in safety concerns, US military aircraft on routine transit flights through international airspace may follow ICAO procedures and utilize FIR services without surrendering any freedom of navigation rights. Aircraft involved in contingency operations, classified or sensitive missions, and routine aircraft carrier operations and training activities are exempt from this policy. Some

nations, however, purport to require all military aircraft in international airspace within their FIR to comply with FIR procedures whether or not they utilize FIR services or intend to penetrate national airspace. The US does not recognize the right of coastal states to apply FIR procedures to foreign military aircraft in international airspace. Accordingly, a US military aircraft not intending to enter national airspace need not identify itself or comply with FIR procedures established by other nations, unless the US has specifically agreed to do so. US military aircraft not following ICAO procedures must fly with "due regard" for the safety of civil aircraft.³

Excessive claims are formally articulated through several means, including the publication of domestic legislation, diplomatic notes, or declarations that may appear as Notices to Mariners (NOTMARs) or airmen (NOTAMs). From a legal standpoint, it is important for governments that do not agree with the claim to publicly indicate their disagreement. If not challenged, over time the asserting country can later argue that the international community has in effect recognized the legality of its claim and that the claim is now a settled matter of international law.

To an aircrew member, the origin or basis of an excessive claim is not as important as

program. Each US president has endorsed the program since then, most recently by President Clinton in 1995 in Presidential Decision Directive/ National Security Council, (PDD/NSC-32) Freedom of Navigation. (An updated version for the current administration is being drafted.) Together, PDD/NSC-32 and PDD/NSC-33, Significant Military Operations and Exercises, establish the policy and procedures for conducting challenges to maritime and airspace claims deemed to be excessive. The Office of the Secretary of Defense (OSD) and the Joint Staff have further amplified the instructions in DoDD C-2005.1, US Program for Exercise of Navigation and Overflight Rights at Sea and CJCSI 2420.01A, United States Freedom of Navigation Program and Sensitive Area Reporting. All of these references are classified and should be consulted directly for information regarding the clearance process within the government, but the following unclassified information will give you a feel for how the program works.

The FON program has three principal methods of addressing claims that the US believes are excessive. These methods may be used individually or in concert. The first is a diplomatic protest that formally registers our disagreement. The second is bilateral consultation where at an appropriate forum,

"The United States will exercise and assert its navigation and overflight rights and freedoms on a worldwide basis in a manner that is consistent with the balance of interests reflected in the [1982 LOS] convention. The United States will not, however, acquiesce in unilateral acts of other states designed to restrict the rights and freedoms of the international community in navigation and overflight and other related high seas uses."

–US Oceans Policy Statement, President Ronald Reagan, 10 March 1983

the impact it may have on the mission-and future missions. The net effect of excessive claims is that they limit or curtail the free exercise of agreed rights of overflight and navigation in international airspace. Legal rights are like muscles-if you don't use them they atrophy and weaken. When you really need them they may not be up to the task. Not challenging excessive claims, or worse yet acquiescing or complying with them, may set a dangerous or unwanted precedent that would not serve US interests well in the future.

Freedom of Navigation Program

In 1979, President Carter established a formal Freedom of Navigation (FON)

sometimes through the ICAO, we discuss our objection with the asserting country and attempt to negotiate a mutually satisfactory position. These first two methods are carried out by the State Department.

The third method is through military operations, whereby the US sails a ship or flies an airplane in a non-provocative routine manner that challenges a particular claim but is consistent with US interpretation of the rules of international navigation. For example, if a coastal nation claims a territorial sea and corresponding national airspace of 20 nautical miles, which is clearly in excess of the 12 nautical miles authorized in international law, the US might

send a plane to fly inside the excessive 20 mile zone, but it will remain at all times outside the recognized 12 miles. Since 1979 the US has filed over 150 diplomatic protests and conducted over 500 military operations asserting the rights to navigate freely in accordance with UNCLOS/ICAO rules. Completed assertions are published on an annual basis, formerly through the annual DoD Report to Congress, and in the future on the DoD public access web site. Table 1 (page 34) depicts the FON challenges completed in FY 2002.

The Process

Within DoD the execution of military challenges rests principally with the regional combatant commanders. Service components within the unified commands, historically the naval component due to the larger impact excessive claims can have on naval operations, nominate a prospective claim and plan for conducting the challenge. The Joint Staff monitors overall implementation of the FON program relative to the growth or reduction of excessive maritime claims by individual states. Each year the Joint Staff, the combatant commands, Services, OSD, REPOPA, US Coast Guard, and State Department develop a “target list” of excessive maritime claims considered priority candidates for operational assertions. REPOPA calls attention to those claims that have never been challenged or have not been challenged in the last several years. Operations planners at the combatant command headquarters use the “target list” to plan, schedule and execute operational FON assertions. The list is discretionary, with combatant commanders encouraged to use available operational opportunities that can contribute to the success of the program. Generally, the regional combatant commander has the authority to approve an operation within his region, although higher authorization may be required if the proposed location is considered sensitive for some reason. What constitutes “sensitive,” and how far in advance and at what level higher authorization must be obtained, are outlined in the instructions mentioned above. Completed challenges are reported annually and become part of the public record.

Air Force and the FON Program

With the global mobility mission of the Air Force, the assignment of Air Force forces to regional combatant commands and other

Air Force owned or operated aircraft including the Guard and Reserve, you would think that the Air Force would be a major participant in the FON program, but you would be wrong! Of the reported FON challenges completed in FY 2001 the Air Force can’t claim credit for any of them. The record for earlier years is not much better. Conceptually, every time the Air Force flies in international airspace without a diplomatic clearance it is, de facto, exercising its right to freedom of navigation even if a formal challenge to an excessive claim is not involved. However, these missions are not now documented or credited under the FON program nor should they be. Only challenges to formal excessive claims are reported under the FON program. That is not to say that AF aircraft haven’t been involved in FON incidents or had their missions impacted by excessive claims.

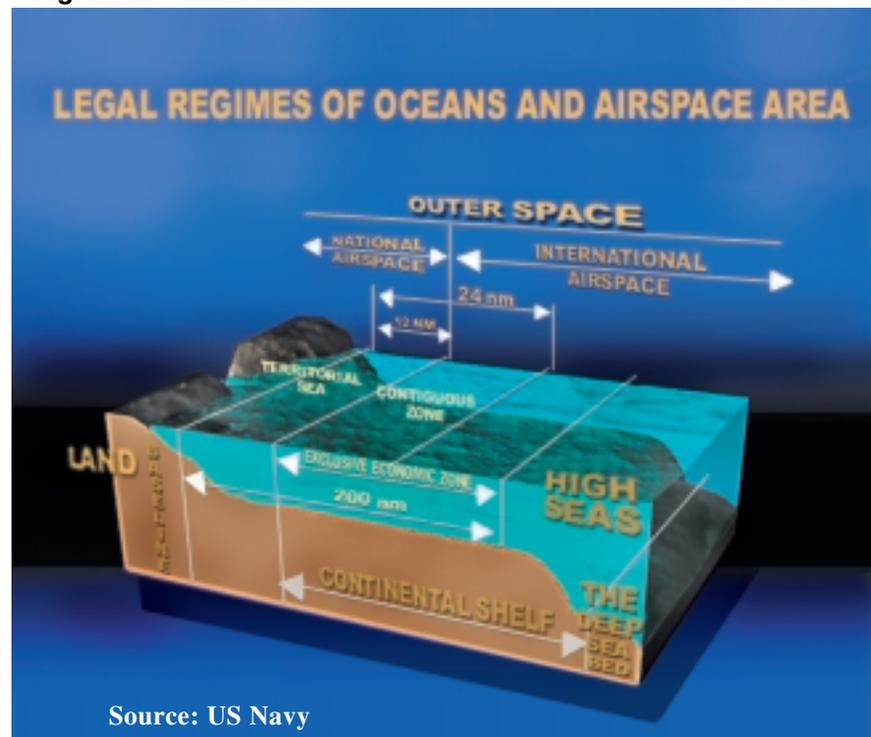
Peru has challenged U.S. aircraft flying over its claimed 200 nautical mile territorial sea on several occasions. International law allows a coastal nation to claim a territorial sea only out to 12 nautical miles. Responses have included several incidents of dangerous maneuvers near U.S. aircraft clearly well in excess of that. Some airborne missions have been diverted or aborted as a result of Peruvian demands.

In April 1992, Peruvian fighter aircraft fired on a U.S. C-130. Though the aircraft was not shot down, one service member died, and several were wounded. The C-130 was operating 60 nautical miles off the coast of Peru.

In February 1995, two U.S. C-130 aircraft were required to abort their mission due to Peruvian refusal to allow entrance into their Flight Information Region (FIR) without diplomatic clearance. Additionally, the flight controllers demanded that the aircraft remain west of 90 degrees west longitude (i.e., at least 650 nautical miles, and up to 1,125 nautical miles, off the Peruvian Coast). It is generally accepted that military aircraft need comply with a FIR only when intending to enter the national airspace of the countries covered by the FIR.

And, like our “hypothetical” example, in March and April of 2001, U.S. Air Force C-5 aircraft were advised by Eritrea controllers that they could not enter the Eritrea FIR without overflight clearance. The Yemeni controllers also advised them that they could not enter the Sanaa FIR without overflight clearance. Yemen authorities threatened to use force if they entered the FIR without prior clearance. At the time, the U.S. aircraft were operating lawfully in international airspace exercising the right of transit passage over an international strait, Bab El

Figure 1.



Source: US Navy

Mandeb, or operating in international airspace over the Red Sea. The Aircraft Commanders in these incidents used the correct procedures and continued the flights to successful mission accomplishment. Diplomatic negotiations through the State Department successfully resolved the claim.

The Navy EP-3/Chinese fighter mid-air off the coast of China reminds us that this problem is not going away. In that incident a U.S. Navy EP-3 surveillance plane and a Chinese F-8 fighter plane collided about 70 miles southwest of Hainan Island. The result was the loss of the Chinese plane and pilot into the sea, while the U.S. plane, with a damaged propeller and nose cone, made an emergency landing at Lingshui, a Chinese air base on Hainan Island. The crew was detained and interrogated for several days and the aircraft boarded and inspected by foreign troops, all actions in violation of international law. The accident occurred when the F-8 made a climb from under the EP-3. The Chinese dispute the cause of the accident. They claim that the EP-3 made a sudden left bank and turn, striking their F-8.

The EP-3 was operating 60 - 80 miles off the coast of China, outside the territorial sea but within China's Exclusive Economic Zone (EEZ). Conventional interpretations of international law support the idea that all aircraft, including military aircraft, enjoy the right of overflight in the EEZ. However, some countries dispute the right of military aircraft to conduct surveillance operations in the EEZ. More recent intercepts in June 2002 indicate continuing Chinese insistence on controlling the military activities of other nations within its EEZ.

Well why is it, you might ask, that a program that appears to have such potential impact on Air Force people and missions has such a low profile among AF flyers?

A Navy Program

It is easy to develop the perception that Freedom of Navigation, while officially a national program, is really a Navy program. There are more excessive claims involving maritime zones than there are involving airspace. Further, restrictions to navigation and overflight have a much greater impact on naval operations. Where the Air Force might simply fly around restricted air space in a matter of minutes or hours with minimal mission impact, naval forces forced to steam around a restriction could take days or weeks, taking them out of position for

extended periods of time. The asserting country's surveillance and detection systems are more likely to identify naval transits given the size and duration of their exposure than they are a single aircraft flight. Sending a fast coastal patrol craft to intercept the "intruder" falls more often within the technical capabilities of coastal states than the more technically sophisticated problem of air intercepts even with surface-to-air systems.

Because excessive claims have the potential to impact naval ops in such deleterious ways, freedom of navigation is a constant consideration in naval planning. It is a prominent subject in the formal training naval officers receive from Division Officer School on up. Unit continuation and work up training include it as a normal part of the training curriculum just like fire and man overboard drills and it becomes an ingrained part of a naval officer's orientation and career development. As the Captain of a naval vessel it is never far from your thinking.

Because of the emphasis that the Navy has placed on the FON program for more than 20 years, naval influence is overwhelmingly present even in the administrative, legal and policy chains. The regional combatant commanders, who carry out the program, automatically look to their naval components

to execute the mission. At every level within DoD, the officers responsible for monitoring and reporting on the program are naval officers. The DoD publication listing the maritime claims of other nations, the Maritime Claims Reference Manual, is maintained and updated by the Navy and is considered the single official source listing excessive claims and their history. It does not, however, include a comprehensive listing of excessive FIR claims, most of which are identified in the DoD Foreign Clearance Guide.

Current Air Force Procedures

The number and locations of excessive claims would be more burdensome on USAF flight planning were it not for the well-established international aviation community and the diplomatic clearance process. Most civil air carriers are part of an elaborate system of agreements that insulate them for the most part from the irksome aspects of most of the excessive claims. Through prior negotiated arrangements they are brought into compliance with the objectives of the asserting country.⁴ The USAF, in its desire to be seen as a "good citizen" within the international aviation community, voluntarily complies with the procedures in ICAO and the FIRs, except when mission needs dictate otherwise.

These procedures include the use of

Table 1. FY 2002 FON Challenges

Countries Against Which Freedom of Navigation Challenges Were Conducted in FY 2002 (1 Oct 01 - 30 Sep 02)

Source: DoD Representative on Ocean Policy Affairs

| COUNTRY | MARITIME CLAIM CHALLENGED |
|---|---|
| Bangladesh | Excessive straight baselines |
| Burma | 24 NM security zone; excessive straight baselines |
| Cambodia (two occasions) | Excessive straight baselines; 24 NM security zone |
| Maldives | Excessive straight baselines; Prior permission for warships to enter territorial sea |
| Philippines (numerous routine transits) | Excessive straight baselines; Claims archipelagic waters as internal waters |
| Sri Lanka | Security zone; prior permission for warships to enter territorial sea |
| Vietnam | Excessive straight baselines; Prior permission for warships to enter territorial sea; security zone |

diplomatic clearances, formal requests to transit airspace controlled (or where control is asserted) by another country. There are many reasons why planners may want to pursue a diplomatic clearance rather than plan the flight through international airspace where clearances and permission from coastal states are not required. For example, it may simply be more direct or efficient; it may allow flight over land rather than long over water legs where more options to divert or make an off-airport emergency landing would be available; or, it may be perceived as less risky than to “challenge” an excessive claim by flying through international airspace where clearance is not required. The Air Mobility Command flight planning section within the TACC, for example, makes a concerted effort to obtain diplomatic clearances for all its flights whose routes bring them into controlled airspace. It only defaults to “no diplomatic clearance” procedures and routing through international airspace when dip clearance denials, processing delays, or short notice mission requirements force a flight to go without a dip clearance. However, using diplomatic clearances may have unintended and undesirable consequences.

Impact of Current Procedures

Managing operational risk in the flying game is always a foremost consideration. Employing diplomatic clearances to get the mission done at the lowest level of risk can be prudent management. There can be no doubt that performing a FON challenge as part of a mission profile introduces an element of risk, albeit manageable, to what otherwise might be a routine transit. That is why FON challenges earn a higher level of scrutiny at all levels of command. However, our crews handle a significant level of risk on every flight through their education, training, experience, and supervision. Including a properly planned and coordinated FON challenge instead of requesting a dip clearance, when all other considerations are equal, would help support the national FON program without undue risk. Further, a dip clearance is, in effect, acquiescence to the asserting state. Rather than challenge the claim, we accept a clearance that accomplishes the same thing...we have asked permission when we didn't have to. It also provides the asserting country the opportunity to say “no”, in which case we usually re-route around the claim instead of simply flying the route through

the excessive claim in international airspace. This has the tendency to lend legitimacy to the claim and establish a precedent of compliance on our part.

Additionally, by complying with the excessive claim, we may be inadvertently undermining the efforts of other US government agencies (such as State Department) or like-minded allies who may elect to challenge the assertion. This practice also gives the asserting country leverage to use against those who would challenge a claim. It may also break our “persistent objector” status on a claim that could prove useful in future negotiations and litigation. At best it would present a confusing picture to the asserting country that may be trying to determine what our true position on the claim really is as well as trying to gauge the strength of our resolve.

Increasing Participation

The sheer number of coastal states worldwide, now numbering about 145, and the number of excessive claims continues to grow. The Joint Staff recently promulgated a memorandum to the regional combatant commanders listing excessive claims of over 50 countries that either have never been challenged or haven't been challenged in the last five years, despite the high OPTEMPO all services have been experiencing. The commanders have been asked to give priority, consistent with operational commitments, to that list in planning their challenges over the next two years. It is unrealistic and inequitable to expect the naval components to perform them all. So, how can Air Force flyers, who fly internationally, help? Answer: Through education and participation.

Educate yourselves on the particulars of the Freedom of Navigation program as outlined in the documents referenced at the beginning of this article. Understand your rights and the procedures in the Foreign Clearance Guide, including the classified supplement, for identifying excessive claims and review the procedures in the event you are challenged or intercepted by an asserting nation.

Participate in the formal FON program by looking for opportunities in the normal conduct of operational mission planning to include a FON challenge somewhere along your route of flight. For forces assigned to a regional command or working on a combatant commander's staff, seek out the command's FON program manager and

explore options for expanding AF participation and methods of reporting execution to command monitors. Route planners in delivery groups, AMC/TACC, in TRANSCOM and in other units not normally assigned to a regional combatant commander but who fly internationally should consider participation as a routine part of mission planning. Remember, however, that coordination in advance with the staff of the affected geographical commander is always required.

Only through the regular and consistent exercise of our rights of transit and overflight in international waters and airspace can we be assured of the freedom to operate so necessary to our global military mission and the expansion of global commerce essential to our prosperity as a nation.

Questions on Air Force participation in the Freedom of Navigation program, excessive claims status, or the Foreign Clearance Guide should be directed to AF/XONP-ISP, Mr. Dale Cheney at DSN: 224-0130 or Commercial: 703-614-0130 or e-mail unclas: dale.cheney@pentagon.af.mil or classified: dale.cheney@pentagon.af.smil.mil

¹*Air Force Operations and the Law, A Guide for Aerospace Forces*, (Air Force Judge Advocate General, First Edition 2002), Chapter 1, page 5.

² *Ibid.*, 10

³ *Ibid.*, 14

⁴Civil carriers must comply with ICAO procedures and do not enjoy the same freedom of navigation rights as do military aircraft that are sovereign instrumentalities of a state. Civil carriers do not require a “diplomatic clearance” to overfly national territory. Usually only air traffic control clearance via a flight plan is all that is required. Of course, they are subject to the usual air navigation fees now being charged by many nations, unlike state aircraft, which do not pay air navigation charges.



Flying Hour Milestones

10,000 Hours

167 AW, Martinsburg, WV
Col Jesse A Thomas
326 AW, Dover AFB, DE
CMSgt Gary E Auld
SMSgt Jonathon Bonnett
934 AW, Minneapolis, MN
CMSgt Marc L Gilbertson

8,500 Hours

32 ARS, McGuire AFB, NJ
MSgt Robert W Fisher
89 AS, WPAFB, OH
CMSgt Timothy R Bellamy
MSgt Ricky D Smith
326 AW, Dover AFB, DE
Lt Col Ronald W Ransom
SMSgt Daniel A Nelis
MSgt Robert L Collins
MSgt Christopher Hammond

7,500 Hours

2 ARS, McGuire AFB, NJ
MSgt Roy M Jones
3 AS, Dover AFB, DE
MSgt Ronald A Needham
6 ARS, Travis AFB, CA
MSgt Jose Moya
TSgt Robert Beall
9 ARS, Travis AFB, CA
TSgt Jackie L Fortner
17 AS, Charleston AFB, SC
MSgt James Blakely
CMSgt Steven Hondel
32 ARS, McGuire AFB, NJ
MSgt James D Bell
89 AS, WPAFB, OH
Lt Col Philip A Pierce
326 AW, Dover AFB, DE
Lt Col John J Keefe
CMSgt David E Burke
SMSgt Phillip W Sabatine
SMSgt Timothy E Ward
356 AS, WPAFB, OH
SMSgt Phillip Fernandez

6,500 Hours

6 ARS, Travis AFB, CA
MSgt Sterling Keller
MSgt Charles Reed
TSgt Kevin Chapnick
9 ARS, Travis AFB, CA
MSgt Steven W Kleman
22 AS, Travis AFB, CA
CMSgt Charles R Robbins
TSgt John M Mincey
89 AS, WPAFB, OH
Maj Kurt A Greenlee
CMSgt Richard Standridge
179 AW, Mansfield AFB, OH
Maj Wayne Snyder
326 AW, Dover AFB, DE
Col Edward S Stokes
Lt Col Paul Gillis
CMSgt Larry D Davis
MSgt Gerald D Allen
MSgt Davy W Dorey
MSgt Gary W Finch
MSgt Kathleen B Lambert
MSgt Henry W Iosbaker
356 AS, WPAFB, OH
Br Gen Hanferd Moen
CMSgt Joseph Gough
CMSgt Randy Miller

908 AW, Maxwell AFB, AL
Lt Col Richard Gilchrist
CMSgt Michael Harper
932 AES, Scott AFB, IL
SMSgt Charles Becket
MSgt Mike Rader
934 AW, Minneapolis, MN
SMSgt John L Sharhus
MSgt Mark H Hartnett

5,000 Hours

PAG, Andrews AFB, MD
MSgt Dana A Lark
TSgt Paul D Guyon
TSgt David L Honrath
1 AS, Andrews AFB, MD
Lt Col Eddie H Waters
TSgt Edwin Dennis
1 HS, Andrews AFB, MD
MSgt Jimmy W Barker
2 ARS, McGuire AFB, NJ
Maj Arnold Starr
MSgt Franklin Castordarryl
TSgt Steve P Johnson
TSgt Roger S Long
TSgt John M McWicker
SSgt Timothy A Heinrich
SSgt Thomas J McCoy
3 AS, Dover AFB, DE
TSgt Marcus L Davis
SSgt Robert D Johnson
6 ARS, Travis AFB, CA
Lt Col Michael Mendonca
Flt Lt Tim Cadman
MSgt Tony Edwards
MSgt Jackie Hale
MSgt Greg Warren
TSgt Rob Tabor
9 ARS, Travis AFB, CA
MSgt Robbie D Wellbaum
TSgt William W Reich III
17 AS, Charleston AFB, SC
Lt Col Mathew Heuer
Maj Andrew Clarke
Maj Scott Clawson
Maj Conrad Guevara
Maj Gregory McCool
MSgt John Bishop
MSgt David Grieve
MSgt Larry Manning
TSgt Raymond Chaudoin
TSgt Donald Eagle
TSgt Herman Rose
TSgt Christopher Schick
22 AS, Travis AFB, CA
Maj Stephen J Collins
MSgt John F Fjellberg
32 ARS, McGuire AFB, NJ
MSgt Alvaro P Abraldes
MSgt Larry W Holdredge
TSgt Terrence D Jackson
TSgt Todd F McPeak
TSgt Joel A Salley
73 AS, Scott AFB, IL
Lt Col Bud Johnson
Maj Ralph De Palma
Maj Rob Witzel
89 AS, WPAFB, OH
Lt Col Richard T Hyland
Maj Gregory L Green
Maj Hans C Lauderbach
MSgt Steven R Parker
MSgt John W Wesley

99 AS, Andrews AFB, MD
Lt Col Ronald W Simmons
MSgt Raul A Santana
152 AW, Reno, NV
Lt Col Chris Ultsch
179 AW, Mansfield AFB, OH
Col James D Conrad
SMSgt Dave Thomas
326 AW, Dover AFB, DE
Lt Col Edward M Poling
Lt Col William D Spence
Maj Bennie Burns
Maj Robert T Moorman
Maj Ryan B Payus
CMSgt Donald L Pommell Jr
SMSgt Gordon F Bentley
SMSgt Donald A Cunningham
SMSgt Jess W Windsor
MSgt Marvin M Foley
MSgt Thomas M Giles
MSgt Oscar D Roher

3,500 Hours

356 AS, WPAFB, OH
Lt Col Steven Johnson
Maj Mark Durant
Maj Kathryn Staiger
MSgt Lottie Wood
908 AW, Maxwell AFB, AL
Lt Col Harrold Griffith
Lt Col Karl Schmitkons
Maj Jeff Spencer
MSgt Brent Solomon
932 AES, Scott AFB, IL
Col Barb Jacob
934 AW, Minneapolis, MN
Lt Col James L Alexander
Lt Col Thomas W Anderson
Lt Col Michael J Bladel
Lt Col Richard B Gabe
Lt Col Michael W Huttner
Lt Col Jack H Pittman
Lt Col Timothy W Purcell
Lt Col Robert B Ross
Lt Col Douglas D Trogstad
SMSgt James G Schmidt

PAG, Andrews AFB, MD
SMSgt Tina M Stein
MSgt Marcus W Holling
MSgt Wanda M Joell
TSgt Susan C Brown
1 AS, Andrews AFB, MD
Maj Christopher J Rossi
CMSgt Brian D Smith
1 HS, Andrews AFB, MD
Lt Col Daniel P Hickey
SSgt Michael J Koss
2 ARS, McGuire AFB, NJ
Lt Col Phillip A Iannuzzi
Lt Col Brian J Lloyd
Lt Col Steven J Schlumberger
Maj Scott E Deitz
Maj Steven S Gauthier
Maj Chris R Hall
Maj Donald E Matthews
Maj Joseph R Roth
TSgt Todd M Cleveland
TSgt David P Decou
TSgt Darren B Holsendolph
SSgt Richard A Pennington
3 AS, Dover AFB, DE
SSgt Illya K May
SSgt Michael J Norland

6 ARS, Travis AFB, CA
Maj Donald Anderson
Maj Brian Henley
Maj Keith James
Maj Charles Melnick
Maj Christopher Rogowski
Maj Todd Staudt
Capt John Distefano
Capt Dave Morisey
Capt Tyler Prevet
TSgt Brian Ennis
TSgt Dan Jorgensen
TSgt Darren Stewart
SSgt Rafael Galvez
SSgt David Olson
9 ARS, Travis AFB, CA
Col Susan Y Desjardins
Lt Col Marshall T Morrison
TSgt Chantry Keomongkhoun
17 AS, Charleston AFB, SC
Lt Col Bradford Barnett
Lt Col James Barr
Lt Col Paul Dorcey
Lt Col Thomas Griffin
Lt Col Richard Keyes
Lt Col Gregory Schwartz
Lt Col Donald Shaffer
Lt Col Mathews Whelan
Maj David Baldessari
Maj Michael Russel
Maj Eric Scott
Capt Jonathon Orourke
TSgt Renee Delarosa
TSgt Thomas Harrison
TSgt Gary Palmer
TSgt Brent Richburg
SSgt Kevin Collette
SSgt Eric Lawther
SSgt Joseph Kapinos
SSgt Trevor Smith
22 AS, Travis AFB, CA
Lt Col Christopher J Bence
Maj James D Sheridan
MSgt Daniel P Haight
MSgt Richard B Larsen
MSgt Thomas E Silverwise
MSgt Kenneth Wenskus
TSgt Craig A Williams
TSgt David M Downs
SSgt Thomas R Albers
32 ARS, McGuire AFB, NJ
Maj David R Mott
73 AS, Scott AFB, IL
Maj Jon Hobbs
Maj Scot Pattison
Maj Dan Wolf
Capt Don Unwin
89 AS, WPAFB, OH
Maj Christopher F O'Neil
Maj Richard J Photinos
Maj Ted R Schiller
Maj David E Turner
Maj Thomas A Walters
SMSgt Michael A Gingras
MSgt Steven Armstrong
MSgt Roger L Schliesman
TSgt David L Withers
97 ARS, Fairchild AFB, WA
Lt Col Michael Foster
Maj Gregory Gorski
Maj Kevin Kniskern
99 AS, Andrews AFB, MD
Lt Col Martin T Gimbus
Maj Christopher J Mayerle

179 AW, Mansfield AFB, OH

Lt Col Gerald A Scrivens
Capt Bruce A Fogle
MSgt Dave Pitroff

326 AW, Dover AFB, DE

Lt Col Maryanne Miller
Maj Theresa L Cave
Maj Mark D Heffernan
Maj Eric D Kesler
Maj Jeffrey A Miller
Maj Louis A Patriquin II
Maj Toland A Petraitis
Maj Eric A Piel
Maj Barry A Rutledge
Maj Edward W Schloeman Jr
Maj Kenneth R Slater
Maj Noel Soderlund
Maj Eric C Weber
CMSgt Donna Lehmann
CMSgt Douglas H Pyatt
MSgt Angelo L Caraballo
MSgt Mitchell P Coffey
MSgt Jacob E Fairburn Jr
MSgt George E Good Jr
MSgt Charles R Harris Jr
MSgt Alan K Holcombe
MSgt Timothy T Jackson
MSgt Gary E Junge
MSgt Keith A Kuykendall
MSgt John Mack
MSgt Prior C Maxwell
MSgt Ted A Peifer
MSgt Anibal Rivera
MSgt John M Shortall
MSgt Scott Simon
MSgt Lucious Washington Jr
MSgt John R Witzke
MSgt Michael K Wright
TSgt Patrick B Naccarato
TSgt Eric P Staniland
SSgt Roger Kline

356 AS, WPAFB, OH

Maj William Barton
Maj David Marlin
Maj Scott Provost
Capt Matthew Smith
Capt Richard Webster

908 AW, Maxwell AFB, AL

Maj Joseph Accardo
Maj Kenneth Bartczak
Maj Steve Catchings
Maj David Hyer
MSgt John Ballentine
MSgt Ben Kemp

934 AW, Minneapolis, MN

Lt Col David J Gerken
Lt Col James J Jirele
Maj Bruce H Besanko
Maj Michael C Dargen
Maj James P Hayes
Maj Robert J Hockman
Maj James C Majors
Maj Noel F Nistler
Maj Thomas J O'Reilly
Maj Timothy J O'Reilly
Maj Paul D Peterson
Maj Donald L Petros
Maj Kenneth C Rogers
Maj Craig A Trammell
SMSgt Michael L Gilbert
MSgt Bradley W Cooper
MSgt Terry A Preusse
MSgt Stephen J Taylor
TSgt Robert S Mattern

2,500 Hours

PAG, Andrews AFB, MD

TSgt Randy C Williams
SSgt Paul W Germain

1 AS, Andrews AFB, MD

SSgt Donnie R Ballard

1 HS, Andrews AFB, MD

Lt Col Walter H Leach
Maj David J Impiccini
TSgt William L Kitzmiller

2 ARS, McGuire AFB, NJ

Lt Col Stuart K Archer
Lt Col Tren O Dudley
Maj Kevin J Kelley
Maj Mark J MacDonald
Maj Fred A McNeil
Capt Aaron B Freed
Capt Jason J Harrison
Capt Matthew W Lacy
Capt Kristen D Lowney
Capt Lawrence W S Mitchell
Capt Matthew A Pasco
Capt Gil W Sanders
MSgt Timothy P McDermott
TSgt Robert S Burdick
TSgt Richard J Clifford
TSgt Loren H Will
SSgt James R Dudgeon
SSgt Chad J Eccles
SSgt Philip R Keeter
SSgt Timothy S Land
SSgt Scott R O'Neil
SSgt Sean Wall
SSgt Daniel D Wallin

3 AS, Dover AFB, DE

Lt Col Mark H Van Benthem
Capt Michael S Cranston
Capt James A Martin
Capt Jay D Miller
MSgt Robert E Devine
MSgt Richard S Sharde III
MSgt Richard S Sharp
TSgt Brent P Anderson
TSgt Michael J Harris
SSgt Robert C Hooker
SSgt Jeffery M Stanley
SSgt Arcenio Santiago
SSgt Christopher G Strawder
SrA Marc A Mellon

6 ARS, Travis AFB, CA

Lt Col Kevin Kilb
Maj Tulley Marriott
Maj Ken Moss
Maj John Millard
Capt Eric Delwiche
Capt Vince Durant
Capt Charles Haley
Capt Allen Horsens
TSgt John Steggel
SSgt Thomas Barger
SSgt Jayson Brady
SSgt Justin Konicke
SSgt Dom Schaller
SSgt Charles Schmied

9 ARS, Travis AFB, CA

Capt David D Leroy
SSgt Michael D Hinton
SSgt Scott J Thomason

17 AS, Charleston AFB, SC

Maj Jeffery Addison
Maj Paul Bauman
Maj Robert Burgess
Maj Christopher Carlsen
Maj James Copher

Maj John Donahue
Maj Derin Durham
Maj David Goretzka
Maj Christopher Kulas
Maj Timothy Mclain
Maj Scott Saunders
Maj William Schellenberger
Maj Jeffery Ward
Maj John Weaver II
Maj Jason Wolf
Capt Scott Anderson
Capt James Harris
Capt Mike Havard
Capt Brian Heriford
Capt Jason Hover
Capt Randall Huiss
Capt Lee Irwin
Capt Stephen Lewis
Capt Stewart Newton
Capt Justin Riddle
Capt Charles Shaw
Capt James Sturch
Capt Joseph Szucs
Capt Brian Wald
SMSgt James Scanlan
SSgt Kenneth Bragg
SSgt John Gudmundson
SSgt Keith Hackney
SSgt Keven Hunt
SSgt Mitch Peters
SSgt John Phillips
SSgt Peter Scheidt
SSgt John Warminsky III

22 AS, Travis AFB, CA

Maj Richard L Bairrett
Maj Patricia E Ervin
Capt William M Barlett
Capt Anthony J Caparella
Capt Eric S Crawford
Capt Douglas D Jackson
MSgt Carlos A Valez
TSgt Timothy M Dew
TSgt Aarne E Kokk
TSgt Todd J Winkleman
SSgt Andrew L Bladow
SSgt Karl D Dendekker
SSgt William B Hoef
SSgt Sean C Scott

32 ARS, McGuire AFB, NJ

Maj George Cyhaniuk
Maj Dale L Landis
Maj Aaron S Quinichett
Capt Leon G Butler
Capt Matthew W Lacy
MSgt Luis E Correa
TSgt Carl T Burdette
TSgt Jose V Figueroa
TSgt Bret G Parlante
TSgt Sidney C Smith
TSgt Rene A Weber
SSgt David M Guerrero
SSgt Saken Rissabute
SSgt Timothy W Sewell

89 AS, WPAFB, OH

Maj Stanley J Bascone
Maj David W Clemmer
Maj Matthew A Duffy
Maj Steven A Schnell
Maj Daniel J Witt
SMSgt Michael W Daulton
MSgt Bryan W Ayers
MSgt Teresa A Pitstick
MSgt Denise R Roberts
MSgt Robert M Welshhans

97 ARS, Fairchild AFB, WA

Maj Eric Berggren
SSgt Jayson Chatham

99 AS, Andrews AFB, MD

Lt Col Thomas J James
Lt Thomas A Henwood
Maj Thomas A Reardon
Capt Matthew A Evans
TSgt Sean A Kirschner
SSgt Benjamin Niese

179 AW, Mansfield AFB, OH

Maj Larry Mullen
MSgt Jason Krupa

326 AW, Dover AFB, DE

Maj Mark W Babione
Maj Richard A Ciaramella
Maj Ian M Frederick
Maj Kevin W Higginbotham
Capt Russell K Carlisle
Capt Luther B Jennings
Capt Wesley K Pangle
Capt Steven A Vaughters
MSgt Kevin R Casquarelli
MSgt Michael C Folker
MSgt Steven O Jones
MSgt Brian L Miller
MSgt Theodore B Sanchez
MSgt Steven T Sharff
MSgt Marchaund L Tiller
TSgt Glenn S Bailey
TSgt Donavan L Beckford
TSgt Amy C Campbell
TSgt Eric R Desandro
TSgt Matthew D Kimbler
TSgt Roderick A Lopez II
TSgt Kimberly E Travis
TSgt Charles W Wampler
TSgt Stephen E West

356 AS, WPAFB, OH

Maj Patrick Driscoll
MSgt Terry Harlow
TSgt Roberto Garcia
TSgt Robin Morris
TSgt David Petterson

908 AW, Maxwell AFB, AL

MSgt Kenneth Bailey
TSgt Orlando Pogue

932 AES, Scott AFB, IL

Maj Skip Mann
MSgt Richard Blattner
MSgt Timothy Ema
MSgt Jose Tamayo
TSgt James Spires

934 AW, Minneapolis, MN

Lt Col Donald R Fleischmann
Maj Peter C Draheim
Maj Richard A Larson
Maj Caleb F Merriman
Maj James C Swartz
Maj Bruce D Wiskus
Maj Timothy W Wollmuth
Capt Mark R VonBerge
SMSgt William D Rudgers
MSgt Curtis W Henke
MSgt Thomas L Kim
MSgt Tom Thomas
TSgt Eugene C Eberhardt

1,500 Hours

1 AS, Andrews AFB, MD

MSgt Cliff Fouts
TSgt Jorge A Aracil
SSgt Willie Watson
SrA John Vera

1 HS, Andrews AFB, MD

Maj Jacque J Wilson
 Capt John S Morales
 Capt Christopher T Yane
 MSgt Roger A Burns

2 ARS, McGuire AFB, NJ

Maj Christopher J Joyce
 Capt Mark A Allen
 Capt Robert B Barnett
 Capt James B Hall
 Capt Guy L Johnson
 Capt Kirk G Palmberg
 Capt Brian A Pete
 Capt Scott B Phillips
 Capt Jamal J Tabeb
 Capt Aaron K Tallman
 Capt Craig G Theisen
 Capt Allison M Trinklein
 Capt Alex M Vlakancic
 Capt Charles T Whitehead
 TSgt Donald P Crawford
 TSgt Shawn A Williams
 SSgt Mark C Barnette
 SSgt Scott M Bishop
 SSgt Richard S Grimes
 SSgt Charles D McManus
 SSgt Christopher S Ottenwess
 SSgt Luis Rodriguez
 SSgt Brian E Vanhorn
 SSgt Robert J Weiterhausen
 SrA Rick L Dorsey
 SrA Jeff S Gordy
 SrA Justin W Pascoe

3 AS, Dover AFB, DE

Capt Todd J Grocki
 Capt Matthew R Hunter
 Capt Perry L Lott
 Capt David S Peters
 1Lt James R Lacey
 1LT Berton R Lee
 1Lt Craig D Lindstrom
 MSgt Eugene A Diemer
 MSgt Robert J Hoepfner
 TSgt Brian K Burrell
 TSgt Willie Currie Jr
 TSgt John W Hegwood
 TSgt Timothy Hicks
 TSgt Eric H Hurns
 TSgt Michael McCoy
 TSgt Oscar W Perez
 TSgt Benigno G Rodriguez
 TSgt Larry C Williams
 SSgt Jeffery Buttillo
 SSgt Richard A Durham
 SSgt Benjamin R Fay
 SSgt Travis Fetterolf
 SSgt Jeffery M Jacobs
 SSgt Chad G Loebler
 SSgt Phillip K Magreevy
 SSgt Shawn R Malcolm
 SSgt Harold E Mason III
 SSgt Michael J Norland
 SrA Anthony D Bettianzzi
 SrA Joseph A Graziano
 SrA John E Menhart
 A1C Damion M Abbott

6 ARS, Travis AFB, CA

Capt Ryan Adams
 Capt Rob Allmart
 Capt Craig Babbitt
 Capt Nathan Bertman
 Capt Mike Brown
 Capt Paul Bruner

Capt June Cruise
 Capt Joe Dingman
 Capt Ryan Eloffson
 Capt Jason Helton
 Capt John Lee
 Capt Jared Paine
 Capt Sukit Pananon
 Capt Doung Pierre
 Capt Darin Reed
 Capt Scott Sullivan
 Capt Shane Turner
 Capt Christopher Watson
 Capt Brent Westbrook
 Capt Kevin Williams
 1Lt Jim Taggart
 1Lt Kris Uber
 SSgt Luis Acevedo
 SSgt John Adtkins
 SSgt Justin Campbell
 SSgt Dave Eisenbrown
 SSgt Ken Lavin
 SSgt Alexandra Minnihan
 SSgt Steven Novicki
 SSgt Phil Orona-Edwards
 SSgt Jeff Sellon

9 ARS, Travis AFB, CA

Capt Joseph J Aguiar
 Capt Jeffrey A Joyce
 Capt Sean E Lee
 Capt Philip D Smith
 Capt Juan A Torres
 SSgt Dexter D Morton
 SSgt Mark J O'Connor

17 AS, Charleston AFB, SC

Capt Roy Bacot
 Capt Richard Carter
 Capt Daniel Dobbels
 Capt Elizabeth Dunn
 Capt Hans Ellison
 Capt Ethan Griffin
 Capt Hugh Hamilton
 Capt G Blane Howell
 Capt Andy Ix
 Capt Clayton Jackson
 Capt Kevin Kotula
 Capt Joshua Larsen
 Capt Patrick Mullen
 Capt Latimer Neal
 Capt Joseph Rolene
 Capt Etienne Rosamont
 Capt Mathew Stahl
 Capt James Thomas
 Capt Charles Velino
 Capt Scott Weber
 Capt Patrick Weeks
 1Lt David Compton
 1Lt Jacob Raser
 TSgt Edward Ebersole
 SSgt Victoria Bruemmer
 SSgt Michael Gillan
 SSgt Hunter Lescoe
 SSgt Renee Morales
 SSgt Michael Morris
 SSgt Jonathan Rabalais
 SrA Chris Akin
 SrA Shaun Brock
 SrA Christopher Cobb
 SrA Paul Guenther
 SrA Christopher Koch
 SrA Gregory Long
 SrA Roger Moore
 SrA Duane Nancarrow
 A1C Jonathan Myrick

22 AS, Travis AFB, CA

Capt Gage A Anderson
 Capt Dick J Blakemore
 Capt Scott E Collins
 Capt Jason T Cousine
 Capt John B Demizio
 Capt Jeremy D Geaslin
 Capt Bradley C Gilley
 Capt Chad G Greiner
 Capt Scott C Linck
 Capt Travis M Rowley
 Capt Aaron A Tucker
 Capt Matthew T Vann
 Capt William O Wade
 Capt Timothy M Welter
 MSgt Carl F Brome
 TSgt Reginald Bazemore
 TSgt Erick J Fierro
 TSgt James W Hunt
 TSgt Kenneth X McCreary
 TSgt James J Pollock
 TSgt Brit D Smart
 SSgt Curtis P Christian
 SSgt Patrick A Delselva
 SSgt Daniel F Factuar
 SSgt Heath F Graham
 SSgt Henry J Hewitt
 SSgt Jason T Margolin
 SSgt Ricardo N Montiel-Torres
 SSgt Michael J Nason
 SSgt David A Seyl
 SSgt Scott T Shrier
 SSgt James M Taylor
 SSgt Timothy A Williams
 SrA John R Crowe
 SrA Robin S Fee
 SrA Timothy G Free
 SrA Russel H Hippensteel
 SrA Joshua K Myers
 SrA Christopher L Rothering
 SrA Michael L Turner

32 ARS, McGuire AFB, NJ

Capt Rodolfo D Alejandro
 Capt Frederick T Deakins
 Capt Scott A Devenish
 Capt Wendy A Devenish
 Capt Ralph D Marshall II
 Capt William D Percival
 Capt Scott L Roy
 Capt George T Walling
 1Lt Phillip A Caldwell
 1Lt Karl F Meyer
 1Lt Bradley O Summers
 TSgt George W Blackwood
 SSgt Daniel G Newberry
 SSgt Thomas L Sinclair
 SSgt Thomas L Sinclair II
 SrA Justin L Mullins
 SrA Doreen A Saal
 A1C Anthony S Honeywell

73 AS, Scott AFB, IL

Capt Roger De Jean

89 AS, WPAFB, OH

Maj Romans Skujins III
 Capt Robert J Ehrenborg
 MSgt John L Costello
 MSgt Jonathan C Winters
 TSgt Jon A Brown
 TSgt Randall J Lynch
 TSgt Sherwood G Sharp
 SrA Lorenzo Law Jr

91 ARS, MacDill AFB, FL

SrA Bernardo A Uribe

97 ARS, Fairchild AFB, WA

Capt Scovill Currin
 Capt Kirt Fiesbeck

99 AS, Andrews AFB, MD

MSgt Dion P Dreschel
 TSgt Scott A Miller
 TSgt Stacey R Newsome
 SSgt Eric P Zabiegalski

179 AW, Mansfield AFB, OH

Maj Wil Baulkmon
 Maj Gregory Galbato
 Capt Scott R McCracken
 Capt James McCoy
 Capt John P Stone

326 AW, Dover AFB, DE

Maj Christopher K Bish
 Maj Thomas J Harmon
 Maj Christopher J Oliver
 Capt David J Bocchino
 Capt Sterling P Davis
 Capt Carl W Gourea
 Capt Brian J Lafaud
 Capt Michael L Mondeaux
 Capt Michael A Mundy
 Capt Sean A Saylor
 Capt Jeffrey S Watson
 1Lt Anita L Westwerner
 MSgt Robert S Bottoms
 MSgt William J Byrne
 MSgt Thomas L Vernon
 TSgt Daniel E Caldwell
 TSgt James A Cini
 TSgt Sterling G Clough III
 TSgt Michael W Duvall
 TSgt James H Foster
 TSgt Glenn A Mills
 TSgt Erik P Paglusich
 TSgt Corey L Pennypacker
 TSgt Alexis B Richardson
 SSgt Marvin S Bonner
 SSgt Adam A Szyzkowski

356 AS, WPAFB, OH

Capt Brett Manger
 Capt Norman Shaw
 1Lt Jason Shaffer
 MSgt Dennis Lott
 TSgt Bret Baker
 TSgt Brian Dawes
 TSgt Jesse Howard
 TSgt Thomas Wilks

908 AW, Maxwell AFB, AL

Maj Madella Womack
 Capt Milagros Weathers
 MSgt Ken Farrey

932 AES, Scott AFB, IL

Maj Treasa Huston
 Maj Melanie Jescavage
 Capt Shaun Carter
 TSgt John Schiffhauer

934 AW, Minneapolis, MN

Maj Drew A Hansen
 Maj Paul D Peterson
 Capt Caroline C Campbell
 Capt Robert T Rettig
 1Lt Christopher S Rieland
 MSgt Orin H Johnson
 MSgt Randall K Lenton
 MSgt Shannon R Moerke
 TSgt Eric D DeCamp
 TSgt Scott R Hellzen
 TSgt Thomas J Reinardy
 TSgt Matthew T Seppala
 TSgt Andrew L Thomas

Quickstoppers

FISHING FOR TROUBLE

Joe and Ernie loaded their poles into the boat, laughing at the antics of the large golden retriever who was running enthusiastically from the boat to the truck and back again. "Lucky sure loves going fishing," chuckled Ernie as he loaded the last of the gear into the boat. "Do you think we need these flotation vests and first aid kit, Joe?"

"Naw," answered Joe. "We both know how to swim and what's going to harm us out there? We will be in the middle of a lake! Snakes and animals keep close to the shore!" As Joe and Ernie moved their boat into position at their favorite "secret" fishing spot, Lucky whined and barked at the water beneath them. "Calm down, Lucky," shouted Joe, as the retriever grew more agitated. As Joe reached out to calm his dog, Lucky lunged at the water. The boat tipped dangerously and Ernie, who had risen to help, was dumped unceremoniously into the water.

Ernie began to swim back to the boat but stopped short when he felt a sharp pain in his leg just below the bottom of his shorts. He looked down quickly and saw a long shadow swimming away. "Oh, no!" he said with a sinking feeling. "Cottonmouth!"

Joe struggled to get Ernie into the boat

before his friend went into shock. Lucky whined his alarm as he lay in the bottom of the boat. Ernie was rapidly losing strength as the poison from the venomous reptile flowed through his body. At last, they headed to the marina and help.

"You are one lucky man," said the doctor after examining Ernie. "You went out without a flotation device - your first mistake. You went out without a first aid kit - your second mistake. And you failed to realize the danger of snakes on a lake - your most dangerous mistake. Snakes can be in water as deep as 15-20 feet deep."

"We know that NOW!" muttered Ernie.

BRAKE FADE

During a training sortie the crew performed an approach and landing to a minimum length runway. The full stop and taxi-back procedures were completed normally. The crew held at the departure end of the runway for ten minutes while they completed the ops stop checklist and coordinated for a departure clearance.

Once cleared for departure, the crew elected to perform a standing takeoff

because the runway available was 5003 feet and the takeoff distance was nearly 4200 feet. During the takeoff roll at 115 knots, two knots below V1, a bird flew by the aircraft toward the number two engine. Suspecting a possible bird strike, the crew aborted the takeoff.

Knowing the runway was short, the crew immediately applied maximum performance braking using thrust reversers and spoilers. Fortunately, the crew was able to slow the aircraft to taxi speed with only feet remaining at the end of the runway. The crew taxied clear, shutdown and let the brakes cool. Approximately ten minutes after the abort, the inboard main wheel fuse plugs blew.

This incident brings to light the importance of considering the potential for "brake-fade" after performing a full stop taxi back. Most technical manuals account for pre-heated brakes in TOLD computations; however, some do not. If your aircraft does not include a TOLD adjustment for pre-heated brakes consider delaying 30 minutes or more after landing, with the parking brake released, to allow the brakes to cool or depart on a long runway. A reasonable technique would be to use a runway length that doubles the TOLD required takeoff distance to account for the unknown effects of "brake-fade."

MOBILITY AIRCRAFT MISHAP SUMMARY

Here is a summary of two years worth of mishaps involving the destruction of mobility aircraft. It is well worth reading.

1. The aircrew flew into a thunderstorm. In the thunderstorm, severe turbulence was encountered. The aircraft suffered structural failure. No survivors.
2. A maintenance technician failed to follow technical data while purging an aircraft fuel tank. The subsequent explosion and fire destroyed both the hangar and the aircraft.
3. An instructor pilot intervened in a copilot's high, fast approach when it was too late. Despite the IP applying full power and raising the nose, the aircraft hit wings level, 761 feet down the runway. The aircraft bounced and the number three engine departed the aircraft. The next touchdown was 2,300 feet down the runway where the the number two engine departed the aircraft. Subsequent rollout and braking was fairly normal. There were no fatalities.

4. During a low visibility approach the crew ducked under the glidepath on short final. The aircraft struck the ground 3,200 feet short of the runway, bounced and settled to the ground 1,500 feet short of the runway. It then skidded and came to rest 800 feet short of the runway where it was destroyed by fire. There were no fatalities.
5. The pilot did not flare the aircraft completely during landing and it struck nosewheel first, 500 feet from the approach end of the runway. The aircraft bounced and landed 1,400 feet from the threshold. At this point the nosegear collapsed, ruptured the forward body fuel tank and ignited a fire. The burning aircraft came to rest 7,575 feet down and 150 feet left of the runway where it was destroyed by fire. One crewmember was fatally injured when he inadvertently passed by the overwing escape hatch and succumbed to smoke and fumes in the back of the aircraft.

There are some interesting themes here. I'm sure everyone reading this has heard about someone who disregarded tech data, flew too close to a thunderstorm, sat through

a scary landing or had an instructor who may have let the situation go a bit further than they really wanted it to. Usually the result was just someone being a bit scared and swearing "I'll never do that again." The folks involved in these mishaps weren't quite so lucky. The other interesting thing is these mishaps could have happened in the last two years...but they didn't. This is actually a summary of accidents that destroyed some brand new KC-135s in 1959 and 1960. I would like to think we have learned a few things in the past 45 years but maybe there is still room for improvement. I know of several recent instances where transport or tanker aircraft have been damaged or destroyed and people killed due to failure to follow tech data, poor landings or late intervention by instructors or other crew members. People will always make mistakes, sometimes with dire consequences, but if we are made aware of ones from the past, maybe we will be a bit more cautious when we make decisions in similar situations. Fly Safe.

Expeditionary Combat Support

Photo by SSgt Aaron D Allmon II

Students deploy from a two ton truck during convoy training April 10, 2002 during exercise Phoenix Readiness, Fort Dix, N.J. Phoenix Readiness is Air Mobility Command's twelve-day program that prepares expeditionary combat support packages for deployed environments. The program includes Joint Training for a multitude of career fields.

