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JUL 2004

Weather And Other Diversions

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contents

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SAFETY SAGE

UPCOMING BASH EVENT

6TH ANNUAL BIRD STRIKE COMMITTEE-USA/CANADA
13-16 September 2004

The sixth annual combined Bird Strike Committee-USA/Canada meeting will be hosted by the Maryland Aviation Administration and Baltimore-Washington International Airport and will be held in Baltimore, Maryland at the Hyatt Regency Baltimore. (To make reservations call 1-800-233-1234 or 1-410-528-1234 by August 10, 2004 and mention the four-letter code BIRD to ensure rate). The early registration deadline has already passed. Contact Betsy Marshall Poggiali of the USDA (betsy.j.poggiali @aphis.usda.gov; phone (419) 625-0242; fax (419) 625-8465) for details.

For more information on the meeting, go to http://www.birdstrike.org/meetings/Bird%20Strike%202004.htm

While we're talking BASH, the *Flying Safety* BASH issue will be in September.

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

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

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E-Mail — jerry.rood@kirtland.af.mil
Address Changes — patricia.rideout@kirtland.af.mil

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CHIEF's Sight Picture

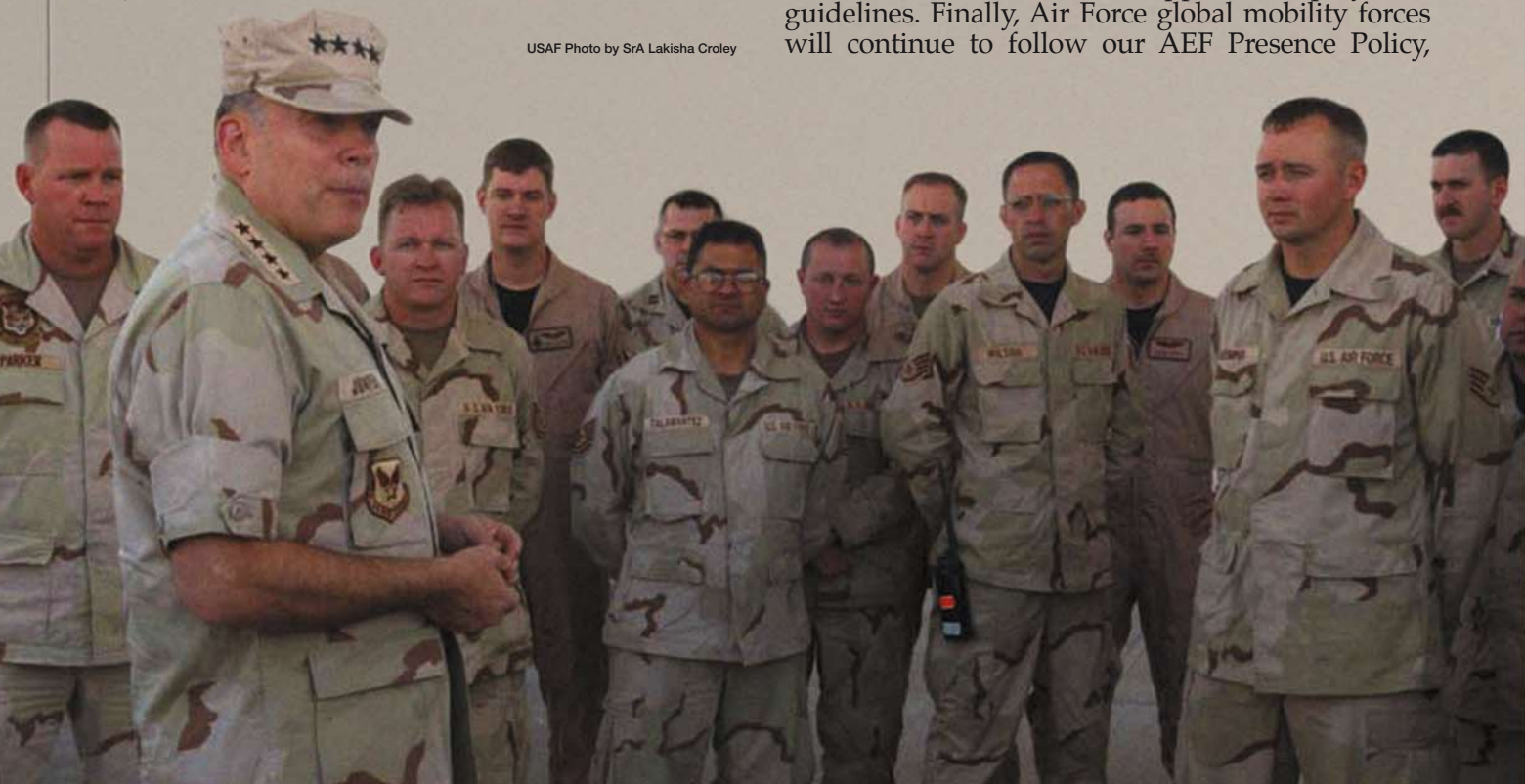
ADAPTING THE AEF—LONGER DEPLOYMENTS, MORE FORCES
4 June 2004

For the past 12 years, our Air Force has adapted to the demands of a changing world. Beginning in the early 1990s, we developed composite wings, expeditionary organizations, and crisis-response packages that allowed us to rapidly deliver combat capability to Combatant Commanders. In 1998, we formalized the structure into ten Air Expeditionary Force packages. These responsive air and space capabilities allow us to present forces in a consistent manner and conduct military operations across the spectrum of conflict. Throughout the late 1990s, our AEF concept of operations has proven itself time and again. Even with the high demands of Operations ENDURING FREEDOM and IRAQI FREEDOM, our AEFs surged to support the Combatant Commanders' warfighting and deterrence missions, employing nearly eight AEFs of combat forces. When major air and space operations diminished last year, we began the process of reestablishing the AEF battle rhythm. Our reconstitution target was March of this year, but the continued demands of global operations, additional contingencies in other theaters, and a tasking to support Army operations with 2,000 of our expeditionary combat support forces required us to reassess our planning assumptions, and to adjust our AEFs to a new mission set.

Simply put, the demands on our deployable forces have not diminished and are not expected to decline for some time. We have a new rotational requirement for nearly 20,000 Airmen--about three times the demand prior to September 11, 2001. Further, the Air Force Component Commander in the Central Command area of operations has asked us to deploy people for longer tour lengths to allow greater continuity for expeditionary commanders in the field. To adapt to this new set of circumstances, I've directed a change to the AEF rotational cycle and have asked our Major Commands to expand the pool of deployable Airmen in each AEF.

Beginning with AEF Cycle 5 in September 2004, the baseline deployment will be 120 days vice 90, and the AEF cycle will change from a fifteen-month rotational cycle to a twenty-month cycle. We will continue to expect that each Airman will deploy only once during each cycle, although some stressed specialties will deploy longer, and in greater frequency, until manpower levels are adjusted or the theater requirements diminish. For those already deployed in AEFs 7/8 (Mar-May) and those deploying in AEF 9/10 (Jun-Aug), it is our intent to stick to our 90-day deployment cycle. For those identified to deploy in AEF 1/2 (Sep - Nov), you should prepare to be gone a minimum of four months. This evolution of the AEF is not a temporary adjustment. More appropriately, it is recognition of new demands around the world for air and space power.

It is important to remember several fundamental principles regarding our AEF concept of operations. First, we are not changing the basic composition of each AEF; each will continue to provide about 5 AEWs and 6 AEGs of capability during each vulnerability period. Our low density/high demand units will continue to follow DoD-approved deployment guidelines. Finally, Air Force global mobility forces will continue to follow our AEF Presence Policy,



USAF Photo by SrA Lakisha Croley

USAF Photo by SrA Christina M. Rumsey

with mobility aviation units postured in multiple AEFs to support the USTRANSCOM mission and other Combatant Commander needs.

The 20-month cycle will continue to provide commanders and Airmen the ability to plan ahead, allowing a sense of predictability while providing greater continuity to the in-theater commander. Still, I recognize longer deployments will present challenges to our Reserve Component, possibly affecting the number of ARC volunteers, and requiring selected use of Presidential mobilization authority. We will manage these matters very carefully, ensuring equity and fairness across the Total Force.

In addition to extending tour lengths, it is my intent to expand our pool of deployable Airmen from our current level of about 272,000. I have asked all of our Major Commands to aggressively review the assumptions upon which they exclude Airmen from our AEFs and take immediate steps to maximize those postured in the Air Force Worldwide UTC System and our AEF libraries. The MAJCOMs will posture the maximum number of manpower authorizations into standard UTCs, and if required, we will develop new ones to provide additional expeditionary capabilities. Residual authorizations will be postured into associated UTCs and will be coded to support AEF requirements across the range of military operations.

Let me be perfectly clear—in our Air Force, every Airman is expeditionary, every Airman will know his/her place in the AEF system, and every Airman will be prepared to support the Combatant Commander, whether deployed, in CONUS via reachback, or employed at home station. If you are wearing the uniform of the United States Air Force, you are a part of the AEF.

We are at war today, and will remain engaged around the globe against a brutal and resilient enemy. Every Airman—Active, Guard, Reserve, and Civilian—must be focused on our national commitment to the Global War on Terrorism. Our job is to deploy and deal with terrorists wherever they are in the world so we never again have to deal with them on our own soil. You will be the difference between our success and failure in this vital cause. Once again, I want to thank each and every one of you for your dedication, professionalism, and service to our nation.

So What's Plan ?

ANONYMOUS

I'm not stupid every day. However, I do have my moments. I try to learn from them though, like any pilot should. Today's lesson: When you move to "Plan B," take a minute and come up with "Plan C," just in case "B" doesn't work out.

I was an IP (still am, for now at least). The other pilot was also an IP, and since he was a whole month senior to me, he was the pilot-in-command (PIC) on this flight. Even though I was sitting left seat, I'll go ahead and admit that I was suffering from a little bit of "co-pilot syndrome," and was perfectly willing to let him handle all the queep. The navigator was also an instructor. Our flight engineer was relatively new to the aircraft, but had almost 20 years of experience in other airframes. We also had a crew chief on board to round out the flight deck.

Our flight was supposed to be pretty straightforward—a six-hour flight from one base to another, with no tanker scheduled and no weather to speak of. It was unusually simple, and therefore was absolutely *certain* to go smoothly, and we mission planned the flight with that mindset.

I'll get right to the important part. We were halfway to our destination and it was becoming apparent that we probably weren't going to have the gas to make it legally. This was partly our fault, of course. We had decided not to top off our fuel load before takeoff, but that wasn't necessarily a bad decision at the time—if things had gone as planned, we'd have had plenty of gas. Of course, Murphy was conspiring against us.

Other factors were not under our control, though. Tower held us short of the runway for an unusually long time to recover arriving aircraft, and we had a pressurization problem on climbout that forced us to hold a few minutes while we fixed it. Most notably, however, the en route winds were nothing like we'd expected, and unless things changed, I calculated that we were going to arrive overhead our destination with our required reserves and not much more. I brought it up to the PIC.

"We'll keep an eye on it," he said.

We requested a weather update from a nearby METRO station shortly thereafter. Now, if you didn't see *this* coming then you've not been flying long enough: Weather was as forecast earlier, but now with a TEMPO group for thunderstorms during our ETA. Our closest alternate had gone from VFR to even worse weather than our destination, and our second choice was closed. The next best field was on the far side of our destination, and didn't seem to make much sense under the circumstances. Sure, it was only a TEMPO group at our destination, but if there was a thunderstorm on the field when we got there, we weren't going to have the gas to muck around.

But it was still no big deal, so far. We just needed to make an unscheduled stop somewhere. We decided on Colorado Springs/Peterson AFB, and

started working the changes, still over an hour away. We checked the weather, changed our flight plan, and even had ATC tell Transient Alert that we were coming. Efficient, forward-thinking decisions, just like you'd expect from two high-caliber IPs.

So, for the next hour or so, we rested on our laurels and congratulated ourselves on our brilliance. Then, as we neared Denver, we started to wonder about the weather forecast we'd received. There was some nasty stuff hanging out just to the west of Colorado Springs, between the airfield and the mountains: an ominous mix of rain and virga. But the field was still clear, and now that we'd cut our trip short we had gas to spare—not much, but some breathing room. I'd done the takeoff, and so the other pilot was flying the approach. Things were going okay until about 1000 feet, when tower reported that a small Piper, just in front of us, had experienced windshear on short final. We went around.

We climbed out and went to holding. Our gas gave us about twenty minutes before we got into our reserves. I started wondering (sort of late!) what we were going to do if the winds at Colorado Springs didn't let up. We had moved to Plan B, but now we had no Plan C. The other pilot was apparently thinking the same thing, and so we started the conversation we should have had about an hour earlier.

"What about Buckley?" he asked us, referring to the base in Denver.

"I think it's closed," said the FE. The nav checked our package of NOTAMs and verified this.

"How about Cheyenne, then?"

"Yeah, sounds good," said the nav. "Let me check it out."

We relaxed a little bit. Cheyenne was a good option. We had gas to do that, still, if we didn't delay too long.

"Get NOTAMs, too." We had not considered Cheyenne as a divert field in our mission planning.

"Roger," said the nav, and made his calls on another frequency.

We queried tower about the winds, and we determined that the windshear had passed. Maybe it was just wishful thinking on our part, but I think we were all getting a little anxious to get the plane down.

So we asked for another approach. The other pilot took this one as well. Yoke hog.

The runway was wet, though, and even though I politely asked three or four times on short final, tower kept giving us crosswinds beyond our Technical Order limits. In retrospect, I'm kind of proud we went around that second time—it was the most tempting thing in the world to blow off our restrictions, but in the middle of our clown show we stuck to our flight discipline. At the time, though, all I could think about was that fuel gauge. It wasn't critical yet; we could still get to Cheyenne.

"Pilot, Nav."

"Go ahead."

"Cheyenne isn't going to work."

I shouldn't have been surprised, but I was. "Why not?"

He detailed the reasons. It was still open, but there was oodles of construction going on and their runway, normally long enough to accommodate us, was now about 2000 feet too short.

Plan D, anyone?

We could see Pueblo Airport to the south. Weather looked okay there, and we verified its length was adequate. Sure, it was a civil field, but I guess we were starting to think in terms of concrete and not much else.

I should probably mention another thing that was lurking in our minds, even though we never really talked about it until afterwards. This situation doesn't seem like a big deal now; we had fuel reserves, and if we'd landed at a non-military field like Pueblo, it wouldn't have been the end of the world. It was never a life-or-death situation, but I for one was worried about the repercussions if we landed with less than our reserve, or at Pueblo. Not too long before this happened, our squadron leadership had severely punished a crew for making some honest mistakes. Their situation had not been their fault; ours was entirely self-induced. So, in the back of my mind, I was wondering about what kind of punishment we'd be getting as we went back out to holding for the second time. Well, I thought, at least I'm not the pilot-in-command.

Speaking of whom, he hogged the yoke for one more approach. The winds were within limits this time. The crew chief was in the observer's seat, and I could actually *hear* the blood rush back into his face as we landed successfully. We figured later that we had fuel for one more approach before diverting to Pueblo.

That's not really the end of the story, but it's enough to make my point.

There were plenty of mistakes to go around on that sortie, but for me one in particular stands out: Always have a "Plan B." When we committed to diverting, we were still over an hour away from Colorado Springs. Plenty of time to come up with a suitable divert base, check NOTAMS, and all the other things we found ourselves doing intently on radar downwind.

Keeping a hip-pocket plan isn't a cosmic or earth-shattering idea, I realize. It's just common sense. But I learned that it was an easy mistake to make. I'm not saying that you should try to plan for every possible contingency—that would be impossible and, frankly, a waste of time. I'm saying stay one plan ahead of the situation. When you move to Plan B, time permitting, come up with a Plan C, just in case Plan B doesn't work out for you. That way, you'll be less likely to be caught off guard, like a few airheads did once over Colorado.

Who's in Charge Here?

CAPT JENNIFER FIEDERER
349 ARS/SE
McConnell AFB, KS

The KC-135 community, like many of the airframes in Air Force today, is undergoing a climate change that may inevitably change our culture. We have evolved from the SAC alert bird to one of the most tapped resources in the Air Force.

As our operations increase, however, unfortunately for most, our experience and knowledge base is decreasing. How can this be? Gone are the days of learning from Friday night's "There I Was" stories at the bar and weeks of alert with IPs readily available to play 20 Questions. Today's crews spend 200+ days in the AOR, training requirements have been slashed in half, and copilots head off to be aircraft commanders with little to no experience dealing with TACC, other than deploying to the desert and back. Leadership is fighting to season their aircrews, but only experience can teach some lessons.

The following is an account of one of my eight deployments into the AOR. I hope some lessons can be learned from my inexperience.

Last December, I was on a jet headed to U.A.E. There were two crews on board, and I was in the jump seat headed into Moron. Our weather brief earlier that day called for 8000-foot ceilings and 10 miles visibility at Moron, and the ATIS indicated the weather to be better than 5000/5. It sounded like another uneventful landing. As we arrived in Spain, there was cloud coverage that seemed to be lower, but since the ATIS was current, we didn't foresee any difficulties making our scheduled landing. We shot the approach, and as you might guess, we did not break out of the cloud layer that seemed to be sitting just over the airfield. As we went around, we queried tower about the weather. A fog layer had rolled in and covered three-fourths of the runway. We went back to approach, called metro and decided to make a second attempt at landing. On our second approach, the fog only thickened. We decided to hold over the field until either the fog lifted or we reached our divert fuel.

While we were holding, we contacted metro again to check on the weather at our divert field, Rota. The weather was VMC, but fog was expected to roll in within the hour. We held for 45 minutes in hopes the fog would lift. We contacted tower to check on the conditions, but they were not improving. As a crew, we discussed our options and decided it was time to press towards Rota before the weather crumped there also. We called Moron command post and requested they contact TACC and let them know we were diverting and to fax our orders to Rota. Control vectored us to Rota approach. While on final approach into Rota, we received a call from Rota command post: "Reach XXX, TACC directs you to turn around and land in Moron. They say you have the weather to land there."

I responded to the call from command post to confirm they knew we had already made two attempts at landing in Moron and had to go around for weather on each approach. Needless to say, the cockpit was a bit silent, and the other aircraft commander and I just looked at each other for a moment. We only had the fuel to make one more approach, but unfortunately the cockpit was filled with instant emotion. How could someone on the ground, thousands of miles away, dare to tell me to turn around? We decided to make one more approach into Moron, then go back to land min fuel at Rota. On the third approach into Moron, we broke out of the fog at 1.3 DME and 255 feet, barely picking up the runways lights to the airfield. Bottom line, we were on the ground in Moron.

After a phone call back to TACC, the duty officer there profusely apologized for any confusion and the undeniable breakdown in communication between the TACC and the information passed from command post. Regardless, what lessons can we take from this fiasco?

First and foremost, emotion is very hard to keep out of the cockpit. Unfortunately, emotion drove our decision to make another approach into Moron. Was returning to Moron the safest option? Absolutely not; we got lucky. What if we returned to Moron and didn't break out and then weather rolled into our divert, not allowing us to land there (oh, by the way, now we are min fuel)? We allowed someone, safely on the ground thousands of miles away, to fly our jet and put us in a less than desirable position. We file weather diverts for a reason; use them. Emotion has no place in the professional aviators' cockpit. Indeed, emotion will often blur your judgment and the safest course of action, as it did here.

Secondly, as a community we are becoming very proficent at filling out ORM worksheets before we step to fly, but are we really internalizing the ORM process? I believe there is an application failure in our community, and perhaps in the Air Force as well. How did we fail to use ORM in this situation? The sixth step of ORM is to "Supervise and Review." On our final approach, we were 10 hours into our sortie, 14 ½ hours into our duty day, it was night, the weather was bad, and we had been attempting to land for an hour. Dare I mention our own personal ORM factors of fatigue and emotions running high? If we had simply taken the time to run through the very same ORM worksheet that we had filled out twelve hours before, I think it would have flipped the light switch. ORM is not just a piece of paper that you fill out so you can go fly. It applies to our lives in the air and on the ground, on duty and off. As aircrew, we have learned to be very flexible and to "make the sortie happen." But we put our safety at risk because we did not update and reanalyze our ORM.

Moral of the story? Increased operations are here to stay. The Global War on Terror has only just begun. In the 135 community, and throughout the Air Force, we are doing more with less. By all indicators, our numbers are only decreasing. More than ever, safety cannot be just a buzz word. Operational Risk Management is a great tool to help us dissect the situation at hand without emotion blurring our decision process.

USAF Photos
Photo Illustration by Dan Harman

DIVERT!

USAF Photo by SSgt David S. Nolan

CAPT KEVIN CURRIE
494 FS/DOD
RAF Lakenheath UK

On questionable weather days, we all plan for the worst. Aircrews depart the field with an updated picture of the day's weather, both what it is now and what the weather shop forecasts for recovery. An acceptable divert is also decided, and joker and bingo fuels are set high enough to return to the field, with enough gas to make it to the nearest suitable divert.

This all makes sense; we leave the field with a plan, we return to the field with updated weather conditions and updated divert status. It's normal to even adjust the bingo fuels when the forecast forces a new divert. Utilizing all the experience and safety-minded tools aviators have available, most standard divert fuels even include an extra pad of fuel for the "just in case" factor. But what happens when everything we plan for gets ruined by an easily avoidable blunder?

On many Air Force bases, there are different aircraft operating from the same field, from airlift and helicopters to tankers and fighters—all on the same piece of concrete or in close proximity. Challenges always arise when these different requirements have to be balanced with limited recourses. For weather days, some of these factors can be minimized with a little bit of prioritization on the part of the aircrews and tower.

With weather, no longer can the aircraft arrive VFR and enter the pattern, keeping approach clear and available. In this case, especially at a fighter base, all the aircraft will recover via the precision approach. Even when the aircraft take off with a higher bingo for divert fuel, RAPCON may be saturated with all the aircraft recovering at the same time, to the same runway, and although above divert fuel, most will be close to divert fuel as they try to maximize their training. Combine this with different types of aircraft and different approach speeds, and the challenge becomes overwhelming.

Smart and conservative pilots would plan on returning to the field with a little more than divert gas just for this situation, so they will have the option to hold for an extra five minutes until it is their turn for the approach. There is no set amount of extra gas that pilots are required to bring back; all that's required is to return with divert gas. So, who should get priority to land first?

Here's the situation: A two-ship in radar trail on the ILS final, another two formations in the holding pattern awaiting the approach, and a heavy aircraft performing a practice approach for their normal training. Both formations holding are within a few minutes of hitting their divert fuel and making the decision to divert or continue holding for the approach. Finally, the first formation is cleared for the radar trail approach; the wingman has slightly less fuel than the flight lead and eventually informs lead that he is less than divert fuel. Approach then informs the fighters to hold the slowest practical speed due to the heavy aircraft they are following on the approach. The fighters slow, but still have closure on the aircraft in front.

The wingman has slightly less fuel than the flight lead and eventually informs lead that he is less than divert fuel.

Approach realizes they don't have enough spacing to allow the fighters to continue the approach. They then inform the fighters to make a 90-degree turn and they will set them up for a small box pattern. The flight lead has enough gas to make the pattern and queries the wingman on his fuel situation. The wingman is still below divert fuel and will not be able to make another approach at this field; he must divert. Instead, the flight lead asks approach to let the wingman continue the approach with the extra two miles of spacing so he doesn't have to divert. The flight lead makes it clear to approach that the wingman is below divert fuel and must land on this approach or he will divert. Approach allows the wingman to continue as lead goes back to hold.

The wingman still closes on the heavy in front of him, as the heavy has a much slower approach speed. Approach again realizes there is not enough spacing for the fighter to continue and breaks off the approach. Now the fighter has to divert at a fuel that is slightly less than divert. The heavy aircraft makes its practice approach and returns to the radar pattern to finish its two-hour sortie of practice instrument approaches.

In order to divert, the fighter climbs as high as he can to conserve fuel. The planned divert fuel has enough fuel to hit the final approach fix, go missed approach, fly to the divert field and recover with VFR fuel. So, there is a bit of slop for the pilot to have some maneuvering room and still recover safely. However, this pilot left with slightly less than divert fuel, but still has enough fuel to make the divert.

Unfortunately, the aircraft is not at minimum fuel, nor emergency fuel and hence receives no priority from air traffic control. Nor did it receive any priority at the home field before diverting. So now the airplane is heading to a divert field that may or may not be familiar to the pilot, with a fuel situation that allows few options if the divert field's weather goes below minimum. The saturation in the divert field's pattern is unknown at this time. All these factors could place the divert aircraft in a dangerous situation.

The repercussions of an aircraft diverting can be hard to calculate. In almost all cases, the aircraft recovers fine, with no incident. Aircraft rarely run out of gas on the way to a divert field. But it is possible. And the cost will be high when we crash an airplane by running it out of gas.

But even when the aircraft diverts safely, there are still costs that must be considered. Fighters will generally divert as a two-ship. So now there are two fighters sitting on someone else's ramp. The base may not be prepared for the hazardous materials the fighters are carrying, and there may not be maintenance personnel to service the fighters.

If they divert other than Code-1 (no maintenance required other than through-flight servicing), maintenance personnel will have to travel the distance to the divert base to fix the airplane. There are travel expenses for the Airmen to reach the airplane, as well as TDY costs for the personnel to remain with the airplanes until they are fixed. Most likely, maintenance will not have the ground equipment and parts pre-positioned for this situation and will incur additional costs—and time—to get the required equipment. All this time, the airplanes sit on the ramp, not being used for training, and the already overworked maintenance squadron is short the people it sent to recover the jets.

All these costs could easily have been avoided, because the weather conditions were known as the fighters were being recovered. There needs to be another term—in addition to minimum fuel and emergency fuel—that gives priority to fuel-critical aircraft to recover to their home station. In this case, the heavy aircraft in front of the fighters could have been broken out of the pattern and sent to another, less saturated field, or simply told to hold until the fuel-critical aircraft were recovered. This would allow all the other airplanes to recover and leave the pattern free for the heavy crew to get its instrument approaches.

With another term, such as "Divert Fuel," approach could be notified to give priority to the fuel-critical aircraft to avoid putting them in a potentially dangerous and expensive situation. With minimal impact to the airfield operations, all the aircraft can recover to their home station, and the Air Force will save money when fuel-critical aircraft are given priority in weather conditions. ⊙

(Editor's note: The issue of divert fuel should be addressed through appropriate wing and stan/eval channels.)

CAPT JOHN KERR
61AS
Little Rock AFB, AR

It was a balmy spring day in Southwest Asia, about 100° F or so with not a cloud in sight. Gulf War 2 was well under way, in its fourth week of unprecedented progress. Our crew had been flying airlift missions out of a brand-new "Base X" for just over a month. The previous week had included a couple of stressful low-level missions into various Iraqi fields, and we were looking forward to a nice, easy day of flying around the Arabian peninsula without having to wear helmets and flak jackets. In addition, we were looking forward to getting some good, unhealthy American-style fast food at our second stop of the day, after a month of scrounging fruit and sodas from other bases that had luxuries we didn't possess. Why do all stories about complacency always include the words "we were looking forward to"?

The first leg of the day was uneventful—it was a beautiful day to fly, and our young-but-talented crew was enjoying the unusually clear flight visibility. The second leg was were the trouble occurred. On approach to "Base Y," we acquired the field visually about 50 miles away and elected to do a simple visual approach to save some time. The forecast, as well as the current ATIS information, indicated winds from the southeast. We were approaching the field perpendicular to the runway, from the northeast into a northwest-southeast oriented runway. Due to the forecast and current winds, we planned for and briefed an approach to Runway 15 and set our instruments up accordingly. About 20 miles out, after we called the field in sight, the tower controller cleared us for a right base to Runway 33. As the pilot was flying the aircraft at the time, I replied, "Cleared right base 33." Experiencing a case of brain-mouth disconnect, and still being fixated on the planned approach to Runway 15, I made a split-second visualization of what I thought the controller wanted us to do. Since a right base to Runway 15 (what I thought was the correct runway) involved overflying the field I said, "Looks like he wants us to overfly and enter a right downwind to a right base." Being absorbed in controlling the aircraft, the pilot replied, "OK." We continued the visual approach that we erroneously thought we had been directed to fly.

A few miles out from the field, with no traffic anywhere in the area, the tower controller called

USAF Photo
Photo Illustration by Dan Harman

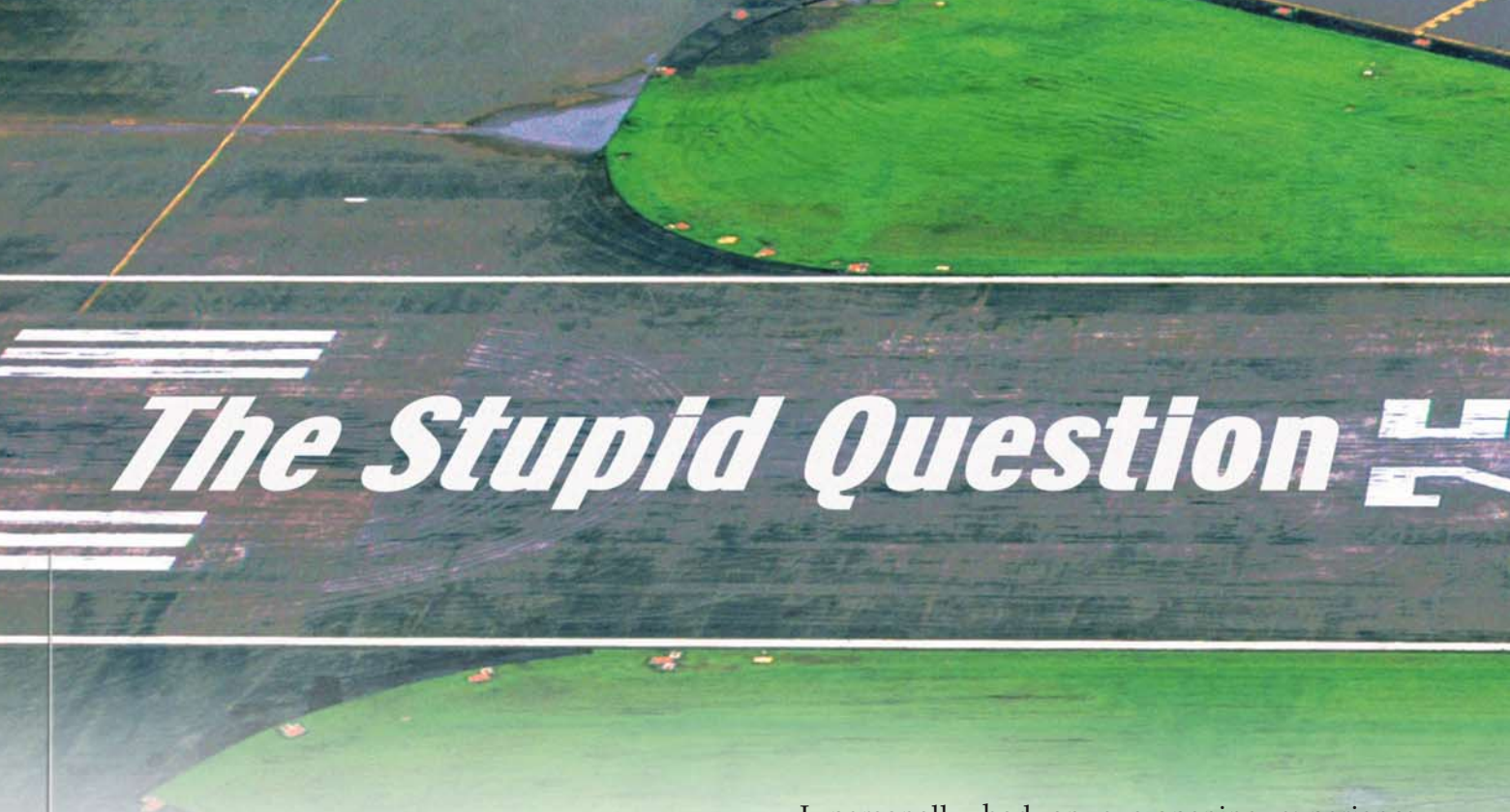
"Cleared to land," not specifying the runway we were cleared to (a typical but procedurally incorrect omission). I returned the favor and made the error chain continue to grow by responding, "Cleared to land" and not verbalizing the runway either. We flew overhead the field and maneuvered for the right base to Runway 15 that we thought we had been directed to fly. On very short final, the tower controller queried us as to our position, and I responded that we were "about to touch down," wondering why he couldn't see us with such great visibility. As we were on rollout, I began to get that hairs-on-the-back-of-your-neck feeling of dread that we've all felt at one time or another, but I couldn't put my finger on what was wrong. After taxiing clear of the runway, the tower controller asked us if we knew we had just landed on the opposite runway from what we had been cleared. With a rush, all of the errors that had occurred in the last five minutes became clear, and I remembered replying that we were cleared for a right base to Runway 33, not 15.

The aftermath of our runway incursion was not as severe as we thought it would be (definitely not as severe as the self-punishment we all put ourselves through), but that is not relevant to the subject of this article. We talked about how disastrous the consequences of our mistake could have been, had there been other traffic in the pattern or on the runway (although, in retrospect, if there had been any other traffic, we most probably would have corrected our wrong assumptions based on the existing traffic flow). We discussed our fixation on the idea that we were cleared for our planned runway, Runway 15. We also discussed the idea that flying an instrument approach would have eliminated the possibility of making such a mistake. All of these are valid points, but perhaps the most dangerous mistake we made on that balmy spring day was to be complacent.

Complacency led to the thought that this was a "milk run" around the peninsula rather than a combat mission, and therefore that we could afford to be a little less alert, a little less observant, and a little less forward-thinking in our plans and our actions. We've all sat through classes on crew resource management and learned how dangerous complacency is in day-to-day operations. Then we've all gone out and, at some point, scared ourselves and/or our crew with a mistake made while performing a simple action or procedure that we've performed a hundred or a thousand times before. The most dangerous aspect of complacency is that it's a fact of human nature.

An old axiom says that familiarity breeds contempt. This is true in the aviation world just as in every other endeavor. How many times have you come across a situation that, when first experienced, made your hair stand on end, but after repeated exposure to the same situation you thought it was no big deal and wondered why it ever made you nervous? For example: at a current forward-deployed location in Southwest Asia, there is an commonly-used parking ramp where the distance between taxi lines and parked aircraft just barely exceeds regulated minimums, and the first time most crews taxi into parking there is a nerve-wracking experience, especially at night. However, by the twentieth or thirtieth time most people taxi in or out, it is not a cause for concern. Has the wingtip clearance increased or has everyone become less concerned about damaging an airplane and losing their wings in a ground mishap? Or has familiarity with the situation bred contempt for the hazards?

I'm not on a soapbox here—I use these examples because they are the ones that have happened to me. The next time you come across a hazardous situation that you've seen "a thousand times," remember—the first time you were in that situation and the hairs on the back of your neck stood tall, it was for a reason. Things may be less dangerous because you've been through it before and know how to deal with it. But things may also be more dangerous because you don't give the dangers the respect they demand.



The Stupid Question

1ST LT RYAN WONG
457 AS
Andrews AFB MD

In Specialized Undergraduate Pilot Training, one of the many things they teach you is the concept of Crew Resource Management. CRM is something you'll take with you after pilot training and use on a daily basis. Regardless of what you go on to fly, nearly every phase of the mission, from preflight to shutdown, incorporates CRM in one form or another. This concept seems to be rather effective, especially when things are "non-standard" because crews tend to take more time to discuss these things. However, many times CRM is paid only lip service.

For CRM to be effective, the entire crew must be comfortable enough with each other to speak up, but many times this is not the case. Especially for the new lieutenant in the squadron who is not yet an expert in the aircraft, CRM can be a tough concept to apply. In pilot training, the young co-pilot learns to respect and trust the instructors in all situations because, generally speaking, the instructor is the "know-all" and final authority. Most times, he or she is correcting you, not the other way around. As a result, this may be a hindrance to effective crew flight operations and CRM, due to the co-pilot's underdeveloped crew concept. Trust may lead the co-pilot to believe that the aircraft commander has everything under control and everything is intentional. But, as we all know, no one is perfect. Conversely, the well-seasoned pilot may have a hard time as well. The senior pilot might not realize how "green" the co-pilot is, which in turn can lead to a breakdown in crew communication and understanding.

I personally had an eye-opening experience with a breakdown of CRM. Although it turned out to be uneventful, we were only an ingredient or two shy of disaster.

I was a student pilot in the T-1, and my flying partner and I were preparing for our six-leg cross-country mission. The pilot we were flying with on this mission was a first-assignment instructor pilot and one of our flight's best and most thorough instructors. The few days leading up to this mission were spent mission planning and working out all the additional logistics. My flying partner and I were well prepared with all the flight plans and planned approaches for our trip.

The morning of the first day of our cross-country, we sat down with our instructor for an in-depth briefing, including CRM. Two aspects of CRM were always emphasized in our standard briefings. We would always brief to keep the "chatter" to a minimum below 10,000 feet, and if anything was to be non-standard or looked unusual we would speak up and discuss it to make sure we all knew what was going on. If that failed, we always briefed the option of using "time out."

I flew the first leg of two for the day. We flew the standard navigation sortie, which included a fix-to-fix and a few instrument approaches, followed by a few traffic patterns. The first leg was uneventful and went as planned.

It was now my partner's turn to fly the second sortie of the day. Our plan was to fly another standard navigation sortie to NAS Pensacola with a drop in at Jackson, Miss., on the way. The approaches and pattern work at Jackson went as planned. Our last approach was to be the HIGH TACAN 25L at NAS Pensacola.

I thought I heard the tower say 25R, and for an instant I thought about saying something when it appeared we were still lined up to land on 25L.

Shortly after the approach briefing and the descent checklist were completed, the request was made to approach control for the HIGH TACAN 25L (this would get us closer to the transient ramp). We were subsequently cleared for the requested approach. This particular approach was an arc to radial (arcing east from the south) that brought us in to the runway at a slight angle. As we got closer to the airfield, we were handed off to the tower. After checking in with the tower and calling a nine-mile final for 25L, the tower came back to us and cleared us to land on 25R. Our instructor then replied, "Cleared to land 25L."

I thought I heard the tower say 25R, and for an instant I thought about saying something when it appeared we were still lined up to land on 25L. However, doubt came to my mind about hearing 25R because I felt our instructor knew what was going on. In addition, I didn't want to say something for fear of "looking stupid" in the event I was wrong. As a result, we flew a flawless approach to the wrong runway.

On landing rollout, tower called us and asked what runway we were cleared for. Our instructor replied, "25L." Tower immediately corrected him, saying we were cleared for 25R. A dead silence followed. Our instructor was now anticipating instructions to call the tower when we got into base ops. Meanwhile, I was sitting in the jump seat feeling as if I had let our crew down by not speaking up when I should have. The mood amongst our crew was a somber one. We had come to the realization of how serious the outcome of our mistake could have been.

Fortunately we landed safely and our instructor did not get violated. However, I still think about that day and wonder what would have happened if there had been another aircraft or a maintenance vehicle on the runway. What turned out to be a simple breakdown in communication with the tower and our crew could have had devastating consequences.

Based on the severity of the possible outcome of a breakdown of CRM, the usual lip service to CRM must become a thing of the past. Effective CRM and communication between the crew are essential to safe flight operations. In order to promote this, it is imperative to have mutual respect amongst the crew.

All crewmembers, no matter how young or old, bring a valuable aspect to the crew. When it comes to safety of flight, no question is a stupid question. ✈

USAF Photos
Photo Illustration by Dan Harman

USAF Photo by MSgt Paul Holcomb


WARNING
Controlled Area
THINK FOD
CHECK TIRES

How We Should Do Business

MAJ TONY BARRELL
DCMA Lockheed
Ft Worth TX

Operational Risk Management (ORM) is one of the most valuable tools we have in our safety tool kits. The Air Force has spent a lot of money to give us the resources we need, to not only train our people how to use ORM, but also to provide some slick tools to assist in completing the ORM process. These tools make it easy to manage operations using ORM. For example, the Air Force Safety Center has a Web-based ORM tool that enables a person with almost any experience level to effectively work through the ORM process with a minimum of fuss. However, it's important to remember that we can make good ORM decisions even when we don't have the formal tools available.

USAF Photo

Last December I was leading a six-ship of F-16s from Fort Worth, Texas, to a destination in the eastern Mediterranean. The aircraft were all brand-new, part of a foreign military sale delivery to another country. Unfortunately, the delivery wasn't going too smoothly.

Production problems at the factory had already delayed the delivery by a couple of weeks. Then, when we were finally ready to go, the tanker broke, and we had to delay another 24 hours. Needless to say, neither the Systems Program Office (SPO) nor the customer were very happy about the delays.

The first leg to Lajes Field, Azores, was uneventful, and the six of us spent the following day sightseeing and enjoying the local hospitality. However, it seems that the local hospitality did not agree with some of us. We had a 1 a.m. show time the next morning for a 3 a.m. launch. Two of the pilots in the flight showed up suffering from mild food poisoning. They both assured me they were good to go, but neither one of them looked well.

Then the weather forecaster delivered some more good news: The weather over the eastern Atlantic was solid clouds all the way to the Strait of Gibraltar. That meant we would fly the first three hours of the sortie on the tanker's wing, in the dark, in the weather, with two sick pilots. I knew we were all experienced, and the two sick guys assured me they would be okay, so I made the decision to press ahead with the sortie.

Our preflight and ground operations went smoothly, the tanker was ready, and it looked as though we would have an on-time takeoff. But, when I called No. 1 for the active, the tower controller told me she had a weather update for our route of flight. She said there was a report of severe thunderstorms in a line across the mouth of the Mediterranean. We would have to fly a two-hour detour around the thunderstorms just to make it into the Mediterranean!

"What should I do?" I thought. "Should I press the weather or wait a day?" I knew some of the guys in the flight were going to Rome on leave the next day and had non-refundable airline tickets for their travel. It would cost them money to reschedule their trips if we didn't take off today. Both the customer and the SPO might be upset if the aircraft showed up another day late. Plus, I thought the destination air base was closed on weekends—if I delayed, it might mean staying at Lajes all weekend. Did I even have the authority to make that decision?

On the other hand, it seemed that I had three strikes against me. From an ORM standpoint, the hazards were clear: two pilots definitely not up to their best, bad weather, and the thunderstorms. I could easily avoid all these hazards simply by delaying the launch a day.

But ORM is not just about avoiding risk. We all know we must accept some risk; otherwise we would never fly. Was this mission worth the risk? It was not an operational mission; we were not going to combat or delivering critical supplies.

So, there I was, cleared for takeoff with five guys and a tanker crew waiting for me to make a decision. And I thought, "Of course I have the authority to make this decision. I am the mission commander, and if I don't make a decision, who will?" So, I cancelled my takeoff clearance and we all taxied back to our parking spots to shut down and wait for another day.

The next day, everyone was healthy, the weather was good, and the destination air base was open and waiting for us. The flight was uneventful and we delivered six new aircraft in good condition to a grateful customer.

Two of the pilots in the flight showed up suffering from mild food poisoning. Neither one of them looked well.

In retrospect, I believe I made the right choice. Neither the SPO nor the customer ever said anything to me about my decision. I did get some grief from the guys about being a wimp, but I know the two sick guys were happy about the decision. And, even though they did not explicitly say so, I think the tanker crew was happy about it, too.

When the Air Force leadership first started talking about ORM, many people complained that we didn't need ORM because that's how we did business every day. I think the best argument against that is: We need ORM because that's how we *should* be doing business every day, but don't. Aviation history is full of unfortunate stories where operators made poor decisions by not considering the risks. In many instances, a poor decision made after considering the risks is still better than no decision made after not considering them at all.

And I think it's important to remember that Air Force members at all levels in the chain of command can, and should, be making ORM decisions. Some risk is acceptable. How much risk we accept is up to our leadership, and they may decide to accept more risk and override your ORM decisions.

That's the risk we take.

(Note: For more information on Air Force ORM, go to: https://rmis.kirtland.af.mil/)

Leaning Forward Too Far Is Like Bending Over

CAPT DEREK RUTLEDGE
92 ARS
Fairchild AFB WA

USAF Photos by MSgt Ron Przysucha
and SSgt Cecilio M. Ricardo Jr
Photo Illustration by Dan Harman

When we train, we usually do a good job of being safety conscious. There is no amount of training that is worth a compromise of safety and a potential mishap. We're taught this from day one, and it's been ground into our brains so much that it's almost second nature. Whether you're calling "knock it off" or telling your copilot to "go around," very few people will fault you for being on the conservative side.

However, when duty calls us to execute a mission, sometimes these safety precautions take a back seat. It's not that we're undisciplined, and it's not that we forget our training. In times of war, we're expected to get the job done as efficiently and effectively as possible. Many of us may have even read letters from high-ranking generals instructing us to "Lean Forward" or to otherwise put a higher emphasis on mission accomplishment. We even have different minimum equipment lists (MELs) for wartime than we do during peacetime. But operating in an environment where there's little room for error, it's easy to put yourself in a precarious situation. I found this to be shockingly true.

I was flying as the copilot of a KC-135 during one of our recent operations. It was supposed to be a routine refueling mission jam-packed full of two-fighter refuelings and two hours of drone time (orbiting while we wait for our receivers to return for more fuel). What I was about to find out, however, was that this refueling mission was going to be anything but routine (insert scary music here). The plan was to refuel a set of F-16s in a certain anchor area (we'll call it Area 1 since the actual names are classified), then refuel them a second time in a different area (Area 2) an hour later. We were to wait in Area 2 for almost an hour before refueling them a third time and then head home. The mission was flown under the watchful eye of the air battle managers aboard the E-3 AWACS.

The first refueling was uneventful, and we left our receivers with plenty of fuel to accomplish the first part of their mission. With approval from the

AWACS, we quietly departed Area 1 for Area 2 and set up an orbit pattern. We had the fighters' mode-3 transponder code flagged in our Traffic Collision Avoidance System (TCAS) to let us know when they were coming back for more gas. The goal now was to find something to keep our minds occupied while we waited for the receivers to return. The wait was a little longer than usual, but not so long that we were concerned. Suddenly, in the middle of a Trivial Pursuit game, I looked down to see two blue blips on the TCAS screen. "Here they come," I said to my pilot and boom operator.

Shortly thereafter, the AWACS controller alerted us that our receivers were on their way and cleared them to contact tanker frequency. The F-16 flight leader then chimed up and verified that they were indeed inbound for more fuel. Apparently, the first half of their mission took a little longer than expected (which explained why they were a few minutes late). The flight leader asked us if we could help them out in making up for lost time by dragging them towards their next target zone (commonly referred to as a "kill box"). The vector that they wanted us to fly would take us outside the protected airspace of Area 2.

Normally, this would not be a good idea, but hey, we were at war here. We felt we should do anything we could to help out our fighter brethren and, by doing so, help the war effort. Besides, what they were asking was not unreasonable. We immediately got on the radios and advised our controller of our intentions before leaving the safe confines of Area 2. "Roger," came the voice over UHF. Shortly thereafter, we had another TCAS hit. This one, however, was not from our receivers but from another tanker! They were heading right for us co-altitude. We were on a collision course of doom (more scary music here).

Apparently, this second tanker had just been given a new vector by a different controller. The reason for this vector was so that they would avoid Area 2, the protected airspace where we were supposed to be refueling. Right about the same time our TCAS went off, we heard the animated voice of our controller frantically trying to give us vectors away from the other tanker. She told us that the traffic was at 12 o'clock and only one mile away. Instinctively, the pilot and I both lifted our eyes to see the underside of a heavy aircraft glistening in the sun as it banked left in the attempt to avoid us. The two jets ended up passing within half a mile of each other (way too close for comfort in the heavy world). Opting not to tempt fate further, we turned back toward Area 2. Luckily, the fighters already had their gas, so they continued on to their kill box and the rest of the sortie went by uneventfully.

Many of us may have even read letters from high-ranking generals instructing us to "Lean Forward" or to otherwise put a higher emphasis on mission accomplishment.

A few things are worthy to note. We advised our controller of our intentions, but never got a specific clearance. I don't know how many times I've heard it said that AWACS is not an ATC facility, and that we are responsible for our own safe separation while operating in the AOR. The controller acknowledged that she was aware of what we were doing, but at the time, she had her hands full with other jets in different areas. Perhaps she was task-saturated. Either way, we were both contributing parties to this near-disaster.

The bottom line is this. We have rules and procedures that are set up that way for a reason. Every time you try to bend the rules you enter a realm where anything can happen. Would it really have been that bad if the F-16s were a few minutes late to their target zone? It certainly wouldn't be ideal, but would it be worth losing two KC-135 tankers and crews to save that little bit of time? Definitely not. So, remember this the next time you decide to "massage" the procedures in the interest of mission accomplishment. You might end up making the last mistake of your life.

Every time you try to bend the rules you enter a realm where anything can happen.

Aviation Safety Reporting
In The 90th FS

HQ AFSC Photo by MSgt (Select) Michael Featherston
Photo Illustration by Dan Harman

MAJ DAVE OTTO
90 FS/SE
Elmendorf AFB AK

As professionals in the aviation safety business, our job includes the identification and control of hazards. This description alone implies a pro-active process. Ideally, we should be able to foresee every activity or condition that leads to an accident, and then eliminate that hazard or mitigate its effects. Unfortunately, in practice, safety shops often end up reacting to hazards in the form of accident investigations instead of being pro-active and identifying the causal factors before the incident occurs.

How can we turn this trend around? What can we do to identify what unacceptable risks are being taken, and where can we get insight into where our next accident may originate? As is often the case, we need only look to our civilian counterparts to find the answer to these questions. Enter the Aviation Safety Reporting System and the Aviation Safety Action Program.

The Aviation Safety Reporting System (ASRS) is a national hazard reporting system that is managed by the National Aeronautics and Space Administration (NASA) for the Federal Aviation Administration (FAA). It is a system that allows anyone involved in aviation operations to voluntarily report incidents that compromise aviation safety. The reports are made anonymously and on a non-retribution basis. NASA collects these reports as an independent third party and gives them to the FAA, which in turn manages a database of reported incidents. Although the events are not investigated

extensively, selected ones are published in a bulletin entitled "Callback" as a method of increasing awareness of potential hazards.

The Aviation Safety Action Program (ASAP) is a voluntary agreement between air carriers and the FAA. It allows the employees of these air carriers to report conditions or information that is potentially hazardous and may lead to an accident. Similar to ASRS, all information is submitted on a voluntary basis and, under the agreement, the reports may not be used as a basis for punishment or disciplinary action by the FAA or the air carrier. Once a report is received, it is given to a committee comprised of representatives from the FAA, the air carrier and possibly the employees union. The committee comes to an acceptable resolution of the problem, thereby eliminating or reducing risk. The program benefits all that are involved by allowing the air carrier to address problems before they arise into major problems or accidents, and by allowing the FAA to access information which would not normally be available without a voluntary reporting program.

So what do a couple of civilian safety programs have to do with us blue-suiters? Simple. If we can enact similar programs, it will be a step toward the pro-active process of identifying hazards in advance and allowing us to address them before they cause a mishap. We can use the information gathered through such programs to let our commanders and supervisors have a "finger on the pulse of the squadron" so they can make good risk management decisions. Individuals can also benefit from the information by having an increased awareness of where others are exposed to risk and be cognizant of it in their own operations. Flight Safety Officers can use the information to tailor safety briefings and focus safety topics on a monthly basis. In all, we can use the information to prevent mishaps, which is our overarching goal.

If this all sounds like a bunch of "pie in the sky" theory to you, let me give you a practical example of how our squadron has implemented a system of hazard reporting. This simple program involves only personal integrity and poker chips. Intrigued? Read on.

We first identified eight hazard areas that are fairly common to any fighter squadron and, if they occur, can result in a mishap or at least an undesirable incident. They are:

1. Violation of altitude blocks within 10 NM
2. Violation of the bubble (500-foot aircraft separation when maneuvering)
3. Violation of the ACBT floor
4. Overflying Bingo fuel
5. Being outside TF parameters below MSA
6. Exceeding air to ground delivery parameters
7. Violating cloud clearances
8. Airspace violations

The idea here is that each of these categories is already scrutinized and debriefed on every sortie by the flight lead. In most cases, an incident goes no further than that. If we somehow track these occurrences on an anonymous basis, we can then honestly look at where our risk is highest and where our prevention emphasis needs to be.

After these categories were identified, we needed a way to track their occurrence. That's where the poker chips come in. We bought a bunch of poker chips along with four small containers, one for each briefing room in our squadron. We marked the poker chips in eight distinct ways and correlated each marking to one of our eight categories. Once that was done, we posted a chart in each briefing room showing the poker chip markings and the associated hazard. We also put a supply of chips in each room along with the drop box for the chips.

Finally, at the next safety meeting, we explained the process to all the members of our squadron. Since the flight lead is responsible for addressing and debriefing any of these events, we simply told the flight leads to drop the appropriate chip in the drop box for each occurrence. As a safety officer, I then collect and tally the chips each month and report them to the commander and the squadron on a quarterly basis. By doing this, we have effectively implemented an anonymous hazard reporting system in our squadron.

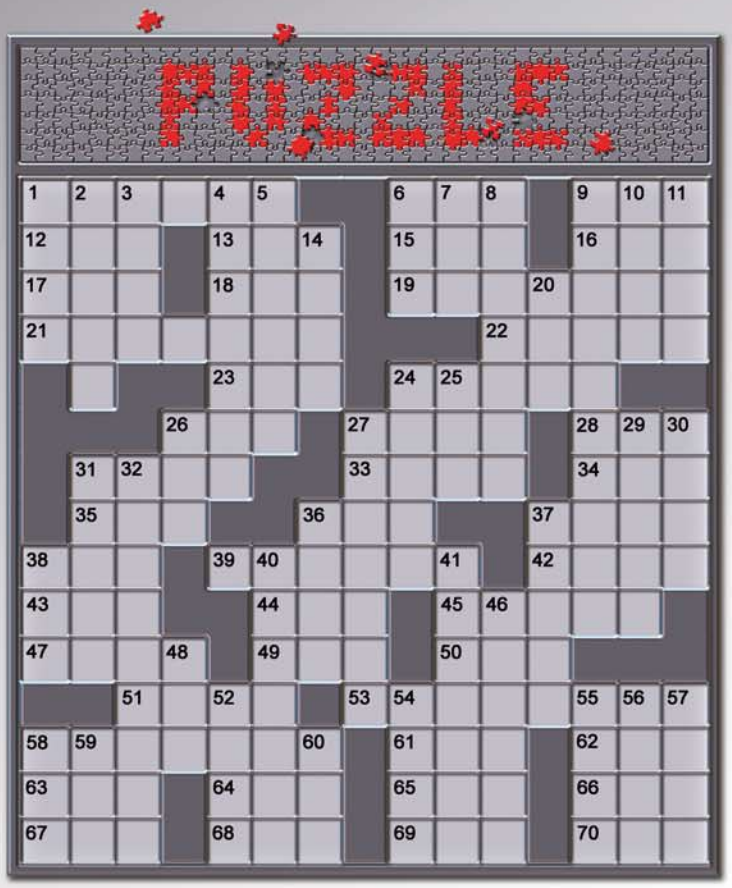
In the safety world, hazard data can be a very useful thing. By collecting this real-time data on our daily squadron operations, I can effectively tailor my safety program to address the issues that are most likely to occur. I can produce briefings and other products that target the most common hazards. Our commander can keep abreast of the risks that we take on a daily basis. Flight leads can tailor their briefs and debriefs to address "problem" areas. Perhaps most important, our individual squadron members have an increased awareness of the hazards associated with our job, and can remain ever vigilant to stop the chain of events that often leads to a mishap.

As I stated earlier, we all are in the business of identifying and controlling risk. In order to make this a proactive process, we need to know what we're doing that exposes us to risk, and we need to know this before a mishap occurs. The civilian world has already implemented some data collection programs that make this possible, and we can only hope that the Air Force will follow suit and establish similar programs. Until that happens, it is up to us individual FSOs to do what we can to identify hazards before they turn into mishaps.

(Editor's note: NASA's "ASRS Callback" is available online at http://asrs.arc.nasa.gov/callback_nf.htm and the FAA's ASAP can be found at http://www.faa.gov/avr/afs/afs200/afs230/asap/)

WEATHER WATCH

BY 1LT TONY WICKMAN
Alaskan Command Public Affairs



ACROSS

1. One of the three cloud forms; thin, wispy and composed of ice crystals
6. USAF enlisted PME school
9. Distant
12. Actress Landry
13. Small cylindrical or tapered pin
15. Allow
16. Onassis, informally
17. Visible minute water droplets suspended in the atmosphere
18. DoD language school
19. Blimp
21. Guarantees
22. Glows
23. Perform
24. Highly unconventional; eccentric or bizarre
26. Back part of a ship
27. Organization concerned with individual rights
28. American air carrier
31. Aid, as in a felon
33. Pet food maker
34. With it?
35. ___ Lakenheath or Mildenhall
36. Web address?
37. Wallet stuffers?
38. Neither's partner
39. Airport runway
42. Take cover
43. Type of benefit package for workers, in brief
44. Ewe sound
45. Brigades
47. Actress Moore
49. Type of landing system, in brief
50. Group of guys
51. Energy return of a radar signal after it has hit the target
53. Cookware
58. Propel
61. North American deer family member
62. The solid form of water
63. British explorer John ____ who charted Canadian Arctic coast
64. American sculptor and architect Maya Ying ___
65. Regret
66. Average grade
67. Mistake
68. Low-power flat-panel display used in laptop computers
69. Rumsfeld office symbol
70. Compute

DOWN

1. Bistro
2. Hungarian form of Helen
3. Outfits
4. Small scale current of air with vertical motion
5. Choose
6. Pie ___ mode
7. Aloha gift
8. One of the three cloud forms; sheet like cloud with no characteristics
9. Temperature scale most commonly used in USA
10. Cantata
11. Tears
14. Drift
20. Big ___; rugged, picturesque resort region along the Pacific
24. Florida city
25. German city
26. USAF deployment set
27. Body of air with uniform temperature and humidity
29. Air that flows in relation to the earth's surface, generally
30. Part of a church
31. Begun
32 Instrument used to measure atmospheric pressure
36. Russian mountain range
37. Know ____ enemy...
38. Actor Beatty
40. Nonliving
41. One of the three cloud forms; develops in a vertical direction
46. Stiff-____; stubborn and arrogant or aloof
48. Specialized section of a hospital
52. Tunnel
54. Type of club on an USAF base
55. A printer's unit of type size, equal to 12 points
56. Perfected
57. Require
58. To exist
59. Auto
60. Terminate

Solution on page 31

AVIATION

The Aviation Well Done Award is presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Mishap Prevention Program.

A1C BRADLEY RAINES
46 AMXS
Eglin AFB FL

An F-16 from the 85 TES was scheduled to fly an operational test mission from Eglin AFB, FL. The F-16 was carrying an ALQ-184 ECM pod to support the mission. The ECM pod had been loaded two days prior, and was loaded on an incorrectly configured centerline pylon. The load crew chief signed off on the loading, and the jet was scheduled to fly. Maintenance personnel, as well as the pilot of the aircraft, carried out preflight procedures and did not notice the incorrect loading of the ECM pod. A1C Raines was conducting final preflight checks in EOR when he noticed the ECM pod extending into the nose wheel well of the jet. A1C Raines thought it "didn't look right," and called the EOR supervisor over to inspect the aircraft. The pilot was informed and taxied back. Upon post-shutdown inspection, it was discovered the pod was indeed loaded incorrectly. Several individuals, including two seven-levels and the pilot, had the opportunity to notice the loading error. Had the jet taken off, the nose gear would have impacted the ECM pod upon gear retraction, causing catastrophic damage to the ECM pod radome, the gear door actuator and the landing gear itself. Total cost for these parts exceeds $20,000. Depending on the severity of damage to the nose gear assembly, the mishap could have easily escalated to a Class B or even Class A mishap. A1C Raines, the last line of defense for this sortie, was thorough and professional in his duties, and single-handedly prevented a very costly mishap.

OPS TOPICS

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

Let's talk about something we haven't talked about in a while, physiological incidents. We continue to have problems with aircrew members who press the limits and fly when maybe they shouldn't have. You make the choice.

Less than 100 Percent

The mishap instructor pilot (MIP) was in the rear cockpit with the upgrade pilot (UP) in the front cockpit. The MIP did not feel 100 percent prior to flight, but could valsalva so decided it was OK to fly. The mission was planned to a destination AFB for a penetration, and then departure back to home base with an interim stop at a local air field for VFR pattern work. Mission preparation, brief, ground ops, takeoff, departure to 13,000 feet, and cruise was uneventful.

Following a turn in holding, UP commenced a normal penetration on the HI TACAN to the runway. Passing approximately 6000 feet MSL, MIP experienced pain on left side of his head. As altitude decreased, the pain increased and progressed to his inner ear. MIP could valsalva normally, but pain persisted. Passing 5000 feet MIP elected to climb back up in an attempt to decrease pain. After climbing back up to 7000 feet MSL, MIP utilized the Afrin he was carrying for emergency purposes. MIP then climbed to 9000 feet MSL for a return to home base. Gradual descent to home base was commenced without incident.

Should the pilot have flown the training sortie? Our flight schedules are busy and the pilot thought he could handle the mission, but ended up not being able to fly for several days. Do you fly when you shouldn't?

Mask Should Fit

A cargo aircraft was conducting high altitude paratroop drops, and the crew had pre-breathed oxygen for 30 minutes prior to flight. At about 24,900 feet on the first drop run-in, the copilot mentioned he noticed symptoms of hypoxia. The copilot went to 100 percent oxygen and in a short amount of time the symptoms went away. The crew finished the first drop, cancelled the remaining drops and returned to base. The end result was that the copilot's mask was not correctly fitted, so it leaked. Good thing he recognized his hypoxia symptoms and communicated them to the crew. Make sure your life support gear preflight is as effective as the aircraft preflight.

Too Many Gs!

The crew departed to the home MOA after an uneventful pattern delay. The mishap crew (MC) performed the AGSM, two power-on stalls, a spin prevention, and a spin recovery prior to attempting the planned acrobatic maneuvers. The mishap student pilot (MSP) incorrectly performed the first loop from which the instructor pilot (IP) demonstrated the second loop, stressing a constant nose track. On the third loop the student again failed to maintain a constant nose track. The IP assumed control of the aircraft to perform a second demonstration. Since this was the fourth loop in the series, the IP did not warn the MSP of the oncoming G forces.

During the second demonstration, the IP increased the G forces to prevent going out of the bottom of the area at 15,000 feet MSL. At 5.1 Gs, the MSP "slumped" over in the seat and lost consciousness. Seeing this, the IP returned the aircraft to level flight and reduced the G forces. The MSP remained unconscious for five seconds, and when he regained consciousness his arms "flailed" a little and he was disoriented and confused about what had just happened. The IP declared a medical emergency and returned to base. Emergency response personnel and the flight surgeon met the aircraft upon landing.

Do you know the limits of your student and/or yourself? Do you accurately communicate what is going on in the airplane to all concerned? I hope everyone aviates, navigates, and communicates.

Clogged Sinus

The mission was uneventful until a rapid descent into the auxiliary field from 22,000 feet MSL. Passing 8000 feet MSL, the mishap student pilot (MSP) reported he was unable to clear the pain in his left ear. The mishap instructor pilot (MIP) immediately took control of the aircraft, initiated a climb to 13,000 feet MSL and declared an emergency. Once level at 13,000 feet MSL, the MSP was finally able to clear the pressure via a valsalva. The crew then flew a slow descent to base, landed uneventfully and were met by emergency room personnel in the end of runway area after engine shutdown. The MSP was transported to the hospital for an examination.

What ended this training sortie? A motivated student who knowingly flew with cold symptoms and did not seek medical attention from the flight surgeon. We all want to hack the mission, but losing more training days due to not taking care of yourself doesn't help the mission.

Not More Gs!

Departure and pattern work at the auxiliary field were uneventful. In the MOA, the mishap student pilot (MSP) performed a split-S and experienced a GLOC episode. The mishap occurred when the aircraft was approximately 45 degrees nose low and about 175 KIAs pulling three Gs. The mishap instructor pilot (MIP) did not hear any G-strain from the MSP prior to the onset of Gs and noted the MSP slumped over the stick at three Gs. The MIP took control of the aircraft and recovered to level flight, and the MSP regained consciousness after about 15 seconds. The MIP selected 100 percent oxygen for the MSP and they recovered the aircraft at home base via an instrument approach. Upon landing, the crew was met by the flight surgeon for further evaluation.

Why couldn't the student handle a measly three Gs? In this episode, a failure to maintain an acceptable level of hydration prior to the flight, and a delayed anti-G straining maneuver were the cause. Even the experienced aircrew can have problems with Gs, so make sure you know the procedures and stay prepared for the flight ahead.

Who Has Control?

The mission was uneventful until recovering to home base. The flying status had changed to instrument status and visibility was deteriorating due to sunset and clouds. The aircraft entered instrument meteorological conditions while the mishap student pilot (MSP) was flying the aircraft on vectors to an instrument circling approach and the mishap instructor pilot (MIP) was making several of the radio calls. The mishap crew (MC) received clearance to the initial approach fix, a decent from 7000 feet to 6000 feet, and again the MIP answered the call. During this period the MSP perceived the MIP took charge of the aircraft to fly the approach. In fact, the MIP had not taken control of the aircraft as the MSP perceived.

The aircraft continued to bank and descend until passing approximately 60 degrees of bank whereupon the crew verbally challenged each other and then both attempted to take control of the aircraft. This further aggravated the situation and the aircraft ended up in an inverted nose-low situation. The MSP perceived the aircraft's attitude as unrecoverable, and began the ejection sequence by pulling the ejection handgrips. During this action the MIP had rolled the aircraft to an upright position and the aircraft came out of the clouds approximately 40 degrees nose low. The MSP stopped the ejection sequence and grabbed the stick together with the MIP to recover the aircraft. The recovery pull was 7.5 Gs and the lowest altitude approximately 2500 feet MSL (1500 feet AGL). The MIP continued the recovery to base, completed the approach and landed uneventfull. The crew was met by fire response personnel who disabled the MSP's ejection seat.

A close call when one of the crew thinks it's time to get out. Crew coordination is critical and communication is key to safe flying. Make sure you talk to each other and you know who is doing what, especially who has their hands on the stick.

Do Things Look Grey to You?

Departure and pattern work at the auxiliary field were uneventful. In the MOA, the mishap student pilot (MSP) demonstrated a weak anti-G strain during exercise, with rapid breathing cycles. Proper anti-G techniques were discussed prior to any further maneuvering. The MSP performed several high G maneuvers, including a loop, a split-S, and a Cuban-8. The MSP experienced a partial grey-out during a 5.8 G nose-low recovery from an MSP-induced extreme nose-low attitude. The crew continued the planned profile, and the MIP performed the first leaf of a cloverleaf. During this maneuver, the MSP experienced a GLOC episode. The aircraft was approximately 45 degrees nose-low and about 175 KIAs, pulling 4.5 Gs. The MSP slumped over the stick at 4.5 Gs. The MIP recovered the aircraft to level flight, and the MSP regained consciousness after about 10 seconds. The MIP selected 100 percent oxygen for the MSP, and recovered the aircraft via an instrument approach. Upon landing, the crew was met by the flight surgeon for further evaluation.

What was the cause of the problem? Same as above, failure to maintain proper hydration and delayed anti-G straining maneuver. I know they are students, but to prevent them from hurting themselves, or others, we need to find a way to ensure they are flight ready.

Maintenance Matters

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

Going to do something different for a change. Each issue will highlight one aircraft and some of the common errors/issues, with the goal being that others will learn from their transgressions. I will start with one of the busiest airframes, the C-17, and some jacking issues.

Jacking Gone Wrong

The aircraft landed and a three-person maintenance team recovered the aircraft and began a post-flight inspection. The team consisted of: one A1C five-level crew chief, mishap worker 1 (MW1); one SRA five-level electro-environmental specialist, mishap worker 2 (MW2); and one A1C three-level automatic flight and instrument specialist, mishap worker 3 (MW3). During the inspection, MW1 determined the No. 2 main landing gear tire required replacement. MW1 relayed this information to the expediter, and the oncoming flight-line production superintendent directed the team to begin preparations for the tire change. All maintenance team members stated they did not feel they were being rushed and MW1 was told, in person, by the expeditor to take their time preparing the aircraft for the tire change. MW1 relayed this information to the rest of the team.

Integral jacking is a C-17 maintenance procedure using on-board stabilizing struts to raise the aircraft and allow repair actions to the main landing gear assemblies and components. In this case, the procedure would be used for the tire change. MW2 told MW1 that he was qualified on integral jacking and would assume responsibility for the task, and MW1 asked MW3 to help MW2.

MW2 completed all tech order steps and procedures, and requested that MW1 assist in clearing the stabilizer strut doors. After the doors were opened and the struts lowered, MW1 attempted to remove the stabilizer strut retaining pin to allow full extension of the strut. The retaining pin had been installed correctly, although in an awkward position. After several attempts to remove the pin, MW1 saw the production supervisor and went to ask for assistance. In the meantime, MW2 was able to remove the pin, allowing the inner cylinder of the strut to extend. MW2 then reinserted the retaining pin, incorrectly placing it in the lower hole instead of the upper hole as directed by the job. Before the production supervisor and MW1 returned to the scene, MW2 relayed that he had been able to remove the pin, so the supervisor returned to his vehicle.

MW1 then set the stabilizer strut switch on the jacking panel to extend. The stabilizer strut extended and lifted the fuselage slightly, while MW1 and MW2 returned to the interior of the aircraft. While MW1 rotated the pressure regulator on the stabilizer strut control manifold, the next step in the job guide, the mishap team heard a loud noise described as a "snap." MW2 exited the aircraft to investigate, and discovered the stabilizer strut had collapsed. MW2 then observed the retaining pin was inserted in the wrong hole. The lower edge of the stabilizer strut outside sleeve was distorted and the retaining pin was sheared. MW1 terminated the maintenance procedures and called for the supervisor.

Another routine task gone wrong. They were qualified for the task and not rushed, so what happened? A simple mistake of putting the safety pin in the wrong hole cost us a damaged aircraft and more work. The questions to ask yourself are: Could you prevent this type of mishap, and could supervision have helped the workers avoid the mistake?

Another Jacking Error

The aircraft returned from a normal training sortie and the mishap crew chief (MCC) debriefed the flight crew and started the aircraft thru-flight inspection. The MCC identified the No. 1 tire as worn beyond limits and prepared the aircraft for integral jacking using the tech order. The MCC inadvertently connected the hydraulic hose used to inflate the strut to the left forward main landing gear (MLG) strut, which was restrained by the ground safety lock (GSL). Prior to jacking the aircraft, the mishap jacking supervisor (MJS) briefed the jack team and verified all preparation steps were accomplished using the tech order. The MJS failed to identify the incorrect integral jacking preparation and gave the command to inflate the strut. Hydraulic fluid then pressurized the MLG strut while the GSL restrained it. The MCC and MJS heard a loud popping sound and immediately halted the jacking operation. The MJS entered

the left wheel well to investigate the abnormal sound and discovered the GSL destroyed, elongated securing holes for the GSL on the MLG post assembly, and a gouge in the chrome portion of the MLG strut assembly. The MJS then identified the incorrect configuration, immediately gave the command to deflate the MLG strut and notified appropriate personnel.

I bet you can think of few things to say about this mishap? Could you find yourself in the same situation as this jacking supervisor? We rely on each other to perform the task correctly, but we all still need some follow-up. Keep your eyes open, and to borrow a saying from Ops, Trust but Verify!

Ineffective Strut Troubleshooting

The aircraft returned from a mission with the discrepancy "stab strut will not retract in auto, must use manual override" documented in the 781s. A 7-level hydraulic technician (MM1) was dispatched to troubleshoot the discrepancy, with a 7-level engine specialist (MM2) as a safety observer and assistant. Using the stabilizer strut operational checkout tech order, MM1 applied hydraulic pressure, opened the strut doors and rotated the struts to the vertical position. MM1 and MM2 found damaged wires on the left stab strut and called for an electrician. MM1 turned off hydraulic power, and both technicians left the aircraft for a short time while the electrician applied F-4 tape to the damaged wires.

Upon returning to the aircraft, MM1 reapplied hydraulic power and continued the operational check. MM1 was unable to get the stab struts to extend or retract using the internal strut extension switch per the tech data. MM2 was standing outside the aircraft to ensure the area was clear of personnel and equipment. Unfortunately MM1 failed to perform the tech data step that directs the rotation of the stab strut control manifold pressure regulator fully counterclockwise until the black band is visible. This relieves hydraulic pressure from the stab struts, allowing them to make contact with the ground but not lift the aircraft.

MM1 joined MM2 outside the aircraft and attempted to extend the stab struts using the jacking switch on the left hydraulic servicing panel. MM1 felt this would help him eliminate a possible source of the discrepancy. When MM1 placed the switch in the "extend" position, the left stab strut extended at its full rate of speed. MM1 realized the struts were extending too fast and moved the switch to the "retract" position with no result. MM1 cycled the switch several times as the struts were descending to try to stop them. When it was apparent the switch had no effect, they backed away from the aircraft to avoid injury. Smart move on their part, as the strut contacted the ground and continued to extend to its full length, at which point the strut pad shifted slightly and caused damage to the stab strut, composite panel and underlying aircraft structure.

After fully extending, the left stab strut retracted to its original position. MM1 checked the tech data to review his actions and realized he had missed a step. They notified maintenance supervision, and safety and Quality Assurance personnel were called to the scene. Is that what you would call an honest mistake or a tech data violation? If a person misses a documented step in a checklist, is it an honest mistake? That is a question that will have different answers depending on who you are talking to and why. What do you think?

Bad Tire Change

Another aircraft was in the process of being integrally jacked in order to change the No. 8 and 9 main landing gear tires. Part of the process to change the tire is to attach a strut lock to the shock strut on the main landing gear bogey. The strut lock was connected to the shock strut with a "T-handled" quick release pin. As the maintainers began to raise the left aft bogey to change the tire, the quick release pin violently shattered. Maintenance personnel stopped the tire change operation and notified Command Post, Quality Assurance (QA) and Wing Safety, and a mishap investigation started.

The investigation found the individuals involved in the tire change were all properly trained on the task of integral jacking, and the training was properly annotated in their training folders. QA concluded the tire change was accomplished in accordance with the tech data, and there was adequate supervision for this task. Based on the data gathered during the investigation, they concluded two probable causes for the mishap: Excessive strut pressure caused an overload condition on the strut-lock pin, and/or the design of the strut-lock pin was inadequate.

The first cause was excessive strut pressure in the shock strut. After this mishap occurred, the strut pressure and X-dimension were recorded for all the struts on the landing gear system. The left aft strut was overserviced, meaning that the strut internal pressure was too high based on the X-dimension of the strut. The events leading to this condition are rather insidious. C-17s spend a lot of time flying into remote/austere fields, and over time, the sand and debris cause the seals in the struts to disintegrate, which allows some of the hydraulic fluid to leak out of the strut. Since there is no gauge to measure the fluid level in the strut, it is impossible to determine whether an adequate amount of fluid remains in the strut. There is, however, a pressure gauge on the strut, and therefore the pressure can be obtained. If a technician sees the pressure low in the strut, they service the strut by adding nitrogen. In the case of this mishap, the struts were low on oil, not nitrogen, and a maintainer had added nitrogen to bring the internal pressure to within tech data limits. The result was an improper oil/gas ratio, which is a cause in many of our strut mishaps.

The second cause, the strut-lock pin, was submitted to the materials integrity branch at Wright-Patterson AFB for analysis. The material analysis report concluded that the strut pin failed in a one-time brittle overload, as evidenced by cleavage on all fracture surfaces. No pre-existing anomalies were observed on the pin, and this failure was most likely a result of tri-axial loading on the pin after initial binding. Follow-on analysis revealed flaws in the pins. The material composition of the pin complied with design, but the overall safety margin did not meet the design criteria. A test to verify the initial design load criteria, and resulted in finding out that the safety margins were actually lower than previously calculated. In short, the strut lock pins are not adequately manufactured to meet design requirements.

Here is a case of improper maintenance and bad design combining to cause a mishap. Proper strut servicing has always been a problem, so ensure you follow the book and take your environment into consideration.

FY04 Flight Mishaps
(Oct 03-Jun 04)

21 Class A Mishaps
9 Fatalities
10 Aircraft Destroyed

FY03 Flight Mishaps
(Oct 02-Jun 03)

26 Class A Mishaps
10 Fatalities
19 Aircraft Destroyed

05 Oct		A C-17 had an engine failure (upgraded to Class A).
09 Oct		A KC-135E experienced a number 3 engine fire.
14 Oct	✈	A T-38 crashed during takeoff.
20 Oct	✶	An F-22 engine suffered FOD damage during a test cell run.
17 Nov		A KC-10 experienced a destroyed engine.
18 Nov	✈	An A-10 crashed during a training mission.
23 Nov	✈	An MH-53 crashed during a mission. Four AF crewmembers were killed.
11 Dec	✶	A C-5 engine had damage from a compressor stall during a test cell run.
30 Dec	✶	An RQ-1 crashed after it experienced a software anomaly.
31 Jan		A KC-10 experienced an engine failure.
03 Feb		An E-4B had an engine failure in flight.
04 Feb		A C-5B had a right main landing gear failure.
25 Feb	✈	An A-10 crashed after takeoff. The pilot did not survive.
27 Feb		A B-1B departed the runway during landing .
02 Mar	✶	An F-15 engine was damaged by FOD during a maintenance run.
03 Apr	✈	A T-6 crashed on takeoff. Both pilots were killed.
29 Apr		A C-130 landing gear collapsed during landing.
05 May		An MH-53 experienced a lightning strike (upgraded from Class B).
06 May	✈	An F-15 was destroyed after it suffered a birdstrike.
08 May		A C-5B had an engine failure inflight.
17 May	✈✈	Two F-16s had a mid-air collision, one pilot was killed.
21 May	✈	An F-15 crashed during a sortie; pilot ejected safely.
06 Jun		A C-17 suffered engine damage inflight.
12 Jun		An A-10 suffered an engine fire.
18 Jun		An F-15 suffered a double engine failure; pilot ejected safely.

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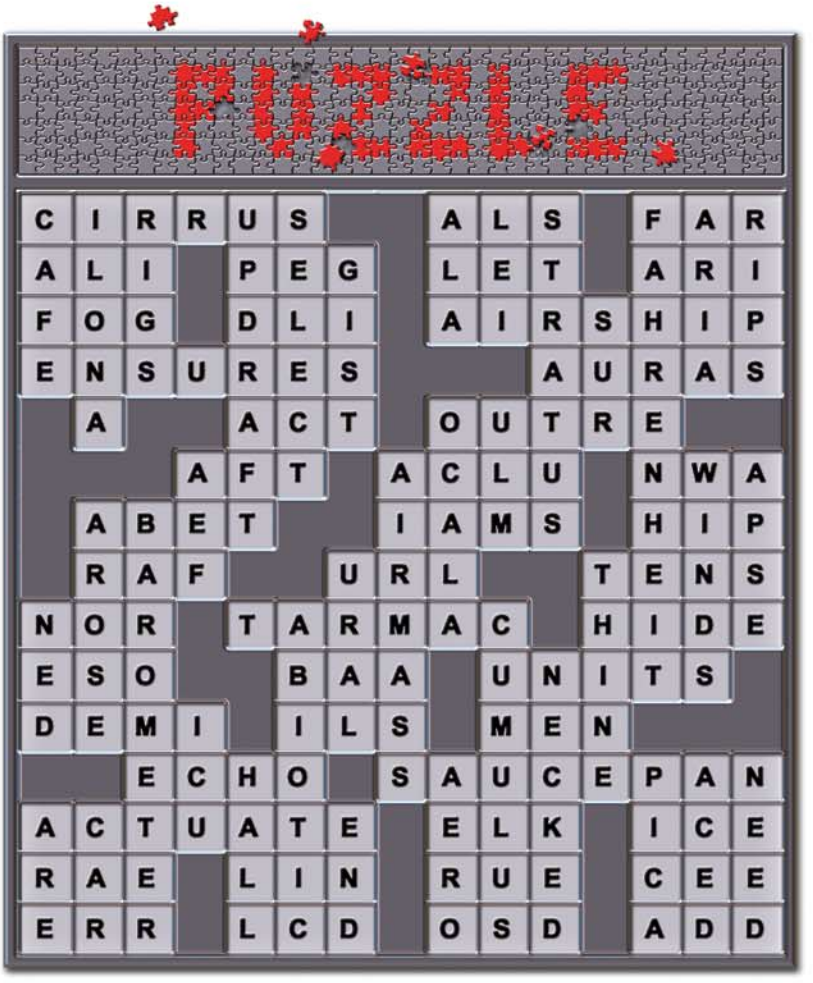
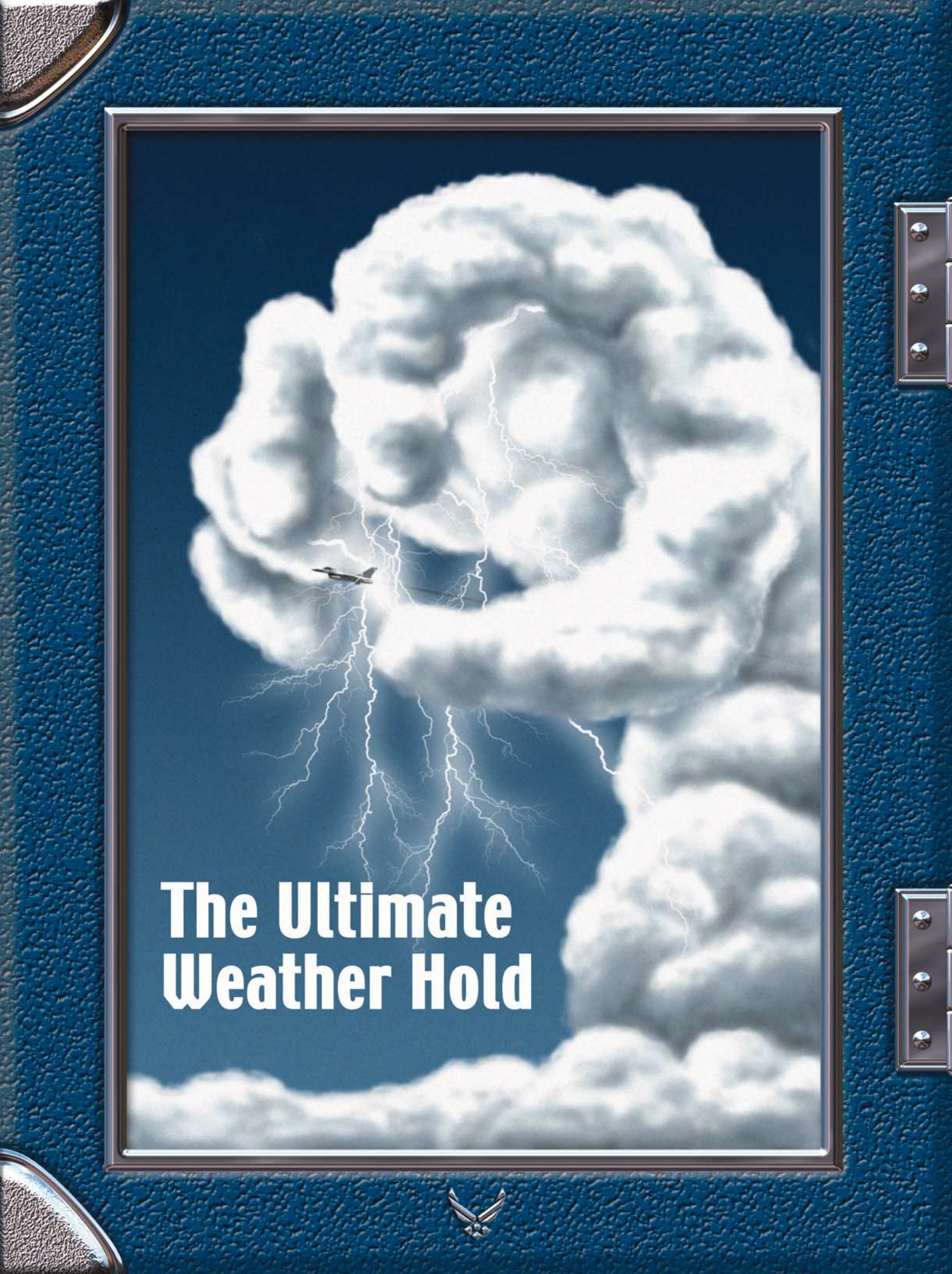
- A Class A mishap is defined as one where there is loss of life, injury resulting in permanent total disability, destruction of an AF aircraft, and/or property damage/loss exceeding $1 million.
- These Class A mishap descriptions have been sanitized to protect privilege.
- Unless otherwise stated, all crewmembers successfully ejected/egressed from their aircraft.
- Reflects only USAF military fatalities.
- "✈" Denotes a destroyed aircraft.
- "✶" Denotes a Class A mishap that is of the "non-rate producer" variety. Per AFI 91-204 criteria, only those mishaps categorized as "Flight Mishaps" are used in determining overall Flight Mishap Rates. Non-rate producers include the Class A "Flight-Related," "Flight-Unmanned Vehicle," and "Ground" mishaps that are shown here for information purposes.
- Flight and ground safety statistics are updated frequently and may be viewed at the following web address: http://afsafety.af.mil/AFSC/RDBMS/Flight/stats/statspage.html.
- **Current as of 24 Jun 04**.

Solution to puzzle on page 24.

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