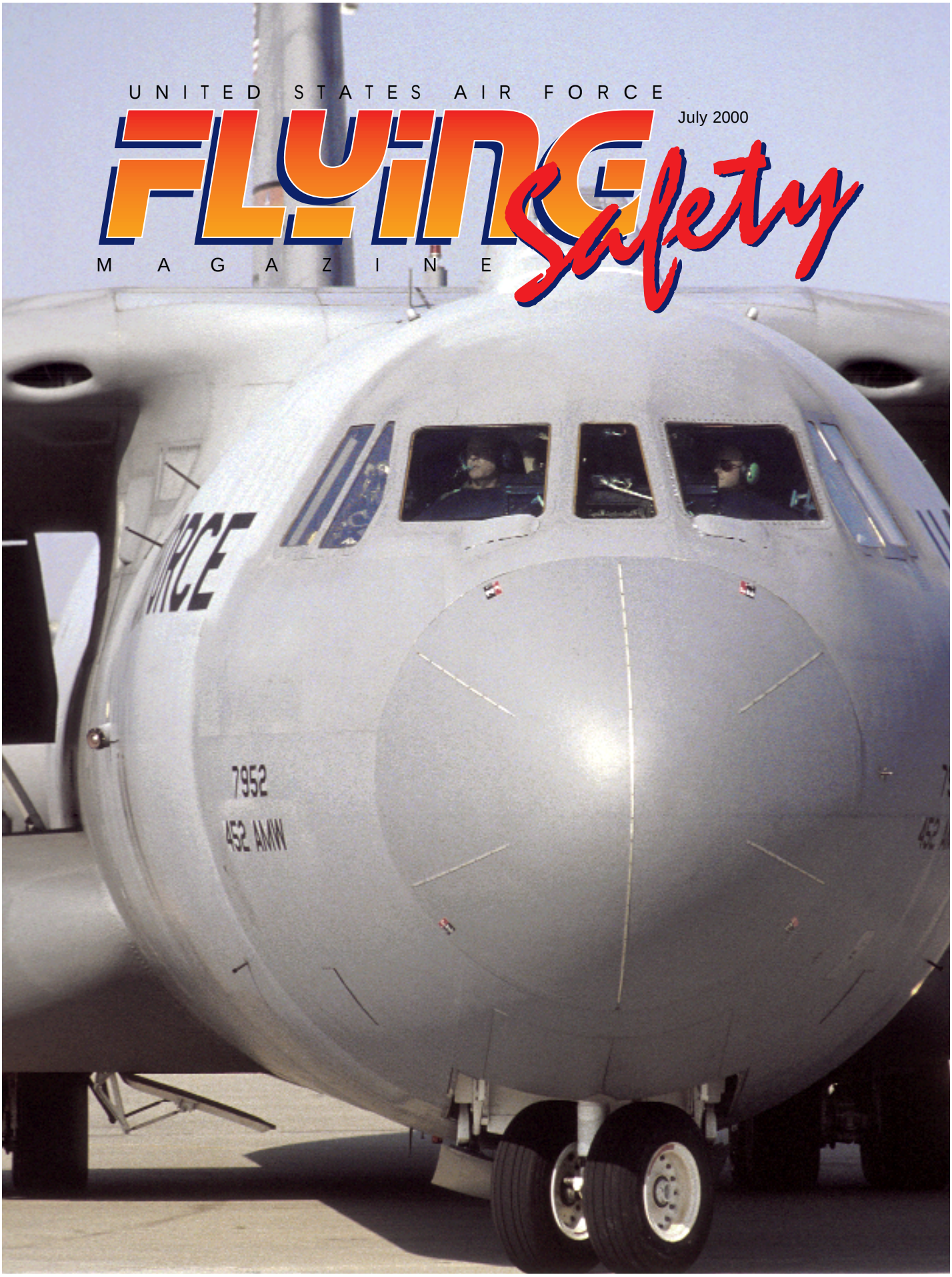
UNITED STATES AIR FORCE

FLYING Safety

MAGAZINE

July 2000



UNITED STATES AIR FORCE
FLYING Safety
MAGAZINE
AIR FORCE RECURRING PUBLICATION 91-1
JULY 2000, VOL 56, NO 7

THE ISSUE:

Cover Photo by MSgt Perry J. Heimer

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Air Force Safety Center web page:
http://www-afsc.saia.af.mil/
Flying Safety Magazine on line:
http://www-afsc.saia.af.mil/magazine/htdocs/fsmfirst.htm

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DEPARTMENT OF THE AIR FORCE —
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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; $32 CONUS, $40 foreign per year. REPRINTS — Air Force organizations may reprint articles from *Flying Safety* without further authorization. Non-Air Force organizations must advise the 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.
DISTRIBUTION — One copy for each three aircrew members and one copy for each six direct aircrew support and maintenance personnel.

POSTAL INFORMATION — *Flying Safety* (ISSN 00279-9308) is published monthly by HQ AFSC/SEMM, 9700 G Avenue, SE, Kirtland AFB NM 87117-5670. Periodicals postage paid at Albuquerque NM and additional mailing offices. POSTMASTER: Send address changes to *Flying Safety*, 9700 G Avenue, SE, Kirtland AFB NM 87117-5670.

CONTRIBUTIONS — Contributions are welcome as are comments and criticism. The editor reserves the right to make any editorial changes in manuscripts which he believes will improve the material without altering the intended meaning.

FSnotams

DPs: What Are They?

CAPT J. C. FINDLEY
Air Force Advanced Instrument School

I don't want to go off on a rant here, but have you heard the FAA now uses new nomenclature for IFR departures? The change is needed and welcome, but there are a few things the USAF aviator needs to know about using them.

The background on this change starts with the C-130 crash in Jackson Hole, Wyoming, in 1996. It was (again) brought to the FAA's attention that corporate knowledge on SIDs and published instrument departure procedures was low. The mishap also highlighted some shortcomings on the design end of IFR departures as well.

What the FAA found was that published instrument departures and SIDs were developed by two different groups of professionals, and each group emphasized different criteria when developing their respective products. As a result, the information portrayed was not standardized. Specifically, a TERPs specialist built published instrument departure procedures strictly for obstacle avoidance. They were never built for things like noise abatement or for an ATC-preferred traffic routing.

SIDs, on the other hand, were built by air traffic controllers strictly for things like preferred ATC routings, simplifying clearance deliver procedures and noise abatement. They were then checked by a TERPs specialist to ensure they would also provide for obstacle clearance on departure. The problem was that there was a lack of standardization in building them and that obstacle clearance was often an afterthought. The problem with published instrument departure procedures is they are often so complex and confusing they are virtually impossible to fly by looking strictly at the textual description of the procedure.

The FAA has decided to fix this problem by combining SIDs and published instrument departure procedures into one entity. The combination will be called DPs, short for Departure Procedures. This involves some major changes for the FAA, but the pilot will use them exactly the way we use the current system. This will, however, require a little education on our part.

What is now happening at the FAA is that qualified TERPs specialists will produce all DPs. They will produce departures for both ATC purposes *and* for obstacle avoidance. The DPs built specifically for obstacle avoidance will be called "obstacle DPs." That sounds a lot like the old published instrument departure procedure, doesn't it? In fact, you use them the same way.

If you are cleared as filed and there is an obstacle DP for the runway you are departing from, you are expected to fly the entire obstacle DP, then to your first filed point. (This is an Air Force requirement unless you filed another DP from the field.) The most notable difference between the old published instrument departure procedure and an obstacle DP is that complex obstacle DPs will be depicted textually *and* graphically. You will see this transition happen slowly.

User groups can speed up the process by requesting that the FAA build a graphically depicted DP for a particular airport/runway. If an airport has an obstacle DP for any runway at the airport, there will be a "Delta T" symbol on each approach plate for the airport. If the obstacle DP is graphically depicted, there will be a reference to it in the front of DoD/NOS approach books under the nonstandard minima and obstacle departure procedures section.

What used to be called a SID is now also called a Departure Procedure, or DP. You will use them just as you used a SID. You may have a DP in your clearance whether you filed one or not. The controller *must* include the name of the DP in your clearance even if you filed it (e.g., Tribe 63, you are cleared as filed, via the Birmingham Three departure to Randolph AFB, climb and maintain 3000'). DPs built for ATC purposes will always be depicted graphically, just as SIDs were. They will be found in the same places you found them when they were called SIDs.

This new verbiage for IFR departures should not be a big concern for the educated aviator, but that's just my opinion; I could be wrong. **Take care and fly safely.**

CAPTAIN GARY L. ROLF
Elmendorf AFB, Alaska

(Captain Rolf, 11th Air Force Airspace Manager, Operations, wrote this article after reading an Ops Topic in a recent issue of Flying Safety. He shares some great insight on how your unit can prevent NMACs like the one described in the referenced Ops Topic. Our sincere thanks to him for taking the time to write this article and highlighting another way to improve flight safety.)

We must expect additional challenges to training airspace in the future...

December 1999's *Flying Safety*, had an Ops Topics short titled "I Go + You Go = Whoa! Whoa." It briefly recounted a near-miss between a B-1B on an MTR (Military Training Route) and a helicopter flying VFR. The chopper crew tried and failed to contact the military RAPCON for advisories near the range, and was apparently unaware they were in the middle of an MTR. The local RAPCON soon afterward distributed educational materials in the local area, and may have been acting as the local airspace manager. That's pretty much where the Ops Topic left us, with a "See and Avoid" message. Given that the article should have been an eye-opener for all of our Wing Airspace Management and Flight Safety shops, where do we go from here?

Suppose the two aircraft had run into each other. Don't think for a minute that there wouldn't have been a huge public outcry that would have inevitably led to questions about the necessity for an MTR in that location. At best, we might have been forced into mitigating the MTR to the point where it was rendered useless for military training.

In certain parts of the country, mainly the West, public concern over MTRs and MOAs (Military Operating Areas) is high enough already, and we don't need mishaps to aggravate the situation. Never mind that the two aircrews in the Ops Topic were "legal." We still would have heard from the public. In an unrelated way, we already have. Several environmental organizations have filed a lawsuit against the Air Force, citing noncompliance with the National Environmental Policy Act with respect to establishment of Military Training Routes. We must expect additional challenges to training airspace in the future that could impact the military's ability to maintain readiness.

What are we, the airspace managers, supposed to do? Chapter 3, "Community Relations," in AFI 13-201, *Air Force Airspace Management*, pretty much spells it out. There's an entire page in Chapter 3 devoted to making the public aware of our mission. As a matter of fact, we're *ordered*, as airspace managers, to work with Public Affairs and Flight Safety to publicize our mission. Evidence suggests we can all do better at that.

Airspace managers need to look closely at this accounting and examine their own pro-

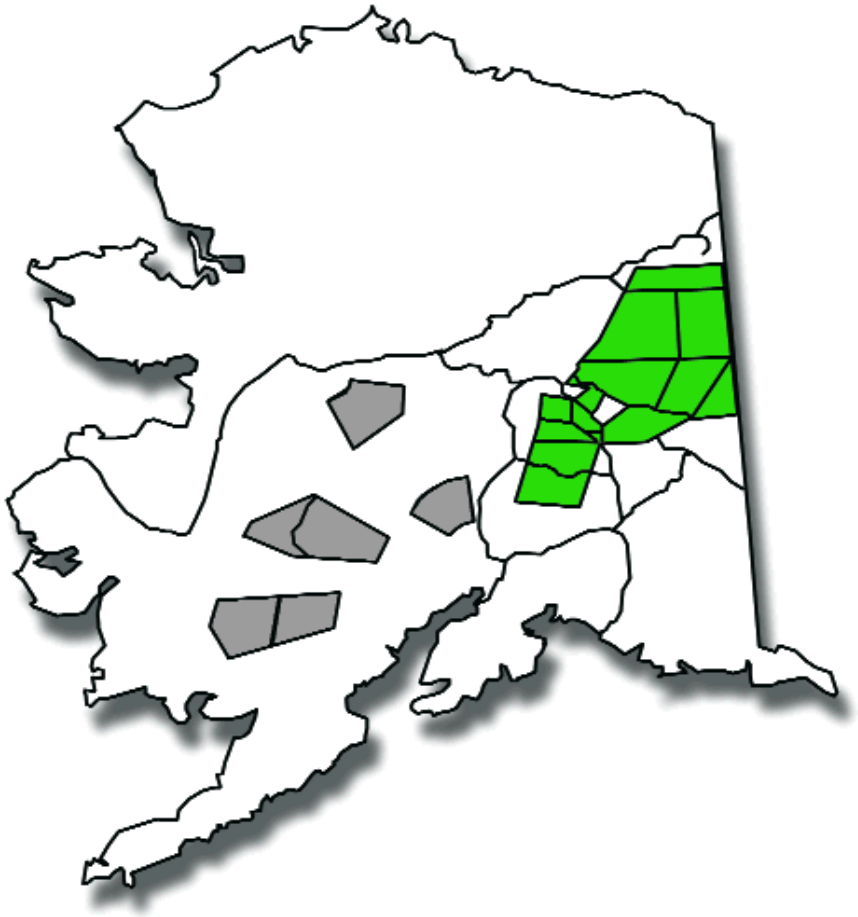

Figure 1. Alaskan Special Use Airspace (MOAs). SUAIS covers a good portion of the highlighted area to the East.

grams. What are you doing with the Mid-Air Collision Avoidance (MACA) Program and the guidance given in AFI 13-201? When was the last time you updated your MACA pamphlet? Remember, the MACA Program isn't just for the home drome. It's supposed to cover all areas affected by our flying operations.

In our case, the Alaska MOA, Environmental Impact Statement Record of Decision, signed by the Secretary of the Air Force in 1997, spells out in more specific terms, how we will keep the public informed.

We provide a contracted service at Eielson Range Control (ERC) called the Special Use Airspace Information Service (SUAIS). This SUAIS covers a large section of Alaska's 62,000 square miles of MOAs that are used heavily by commercial, private and military VFR traffic. See figure 1. Some of the special use airspace area is covered by radar, and some by radio alone.

Our SUAIS gives the public the ability to get the latest military activity by phoning ERC or calling in on VHF radio. It also provides a web page where maps and exercise schedules can be obtained. Our service gives long-range planning information, as well as near-real-time aircraft activity. It also gives traffic information to military participants. In fact, it's a requirement for special-use airspace participants to check in.

While this service is effective, it is high-maintenance. However, the flying public really appreciates it. We conduct public meetings semiannually to discuss the ongoing status. We also publish 10,000 SUAIS pamphlets annually for distribution around the state. These pamphlets provide one-stop shopping for information about the military training airspace. The Alaska contact for

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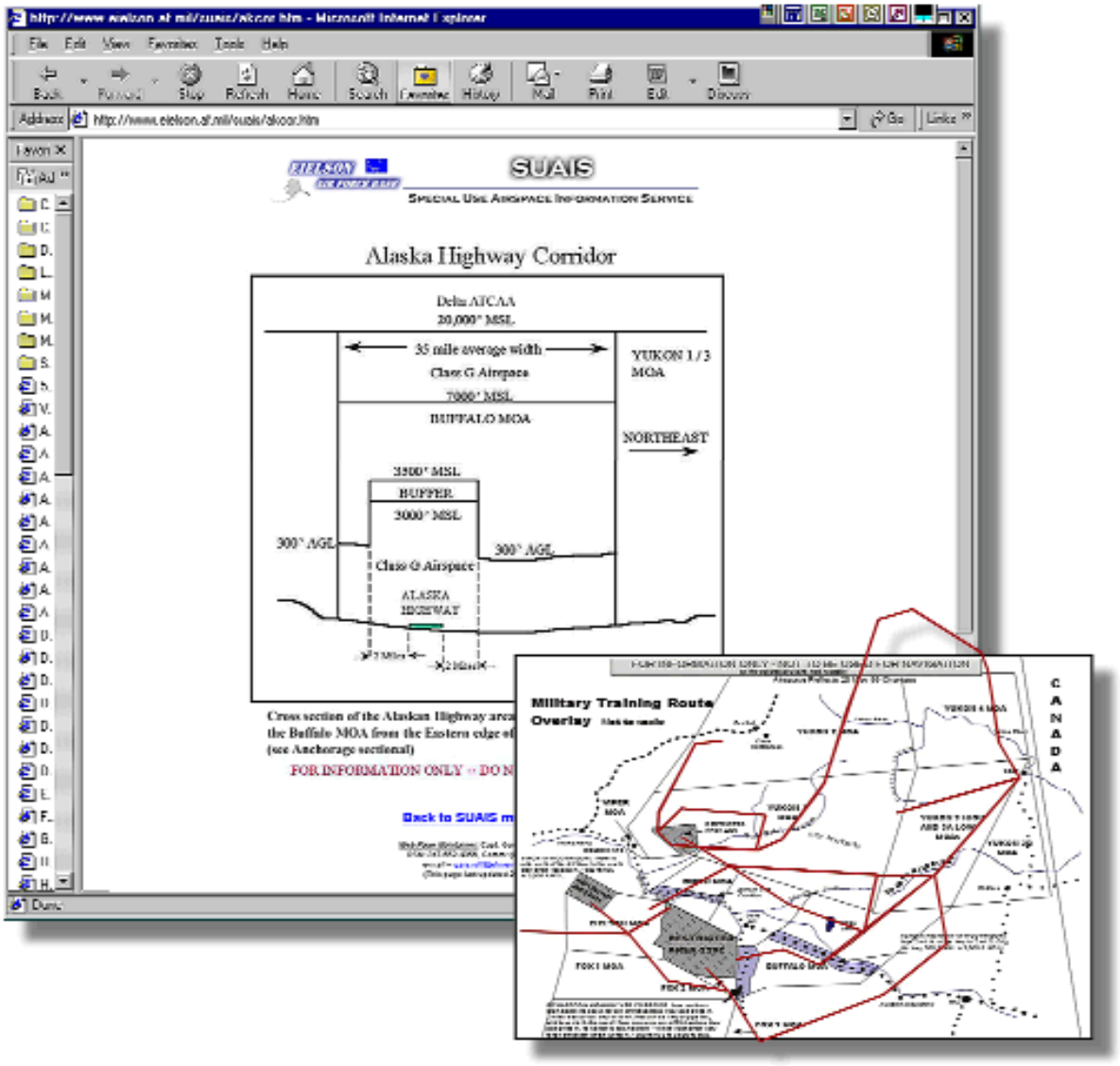
When was the last time you updated your MACA pamphlet?



We must be good stewards of our training airspace.

Aircraft Owners and Pilot's Association and the Alaskan Aviation Safety Foundation send them to Lower 48 pilots planning summer trips up North. We also place an ad in *The Milepost* magazine, a major tourist publication for the state.

The answer to the question, "Does the Air Force do enough?" is usually "Yes." The answer to the question, "Could we do better?" will always be "Yes." Is a service like this expensive? That depends: How long do you want to hold onto your airspace?

Times have changed and waving the flag doesn't cut it any longer. We must be good stewards of our training airspace. Our AFIs account for this. We just have to follow them and stay vigilant. Working with the public, communicating training requirements and adhering to established procedures will help to preserve military training areas and keep everyone safe.

To get an idea of how we do it in Eleventh Air Force, check out the Special Use Airspace Information Service link at www.eielson.af.mil. (Above is an example of information available at the SUAIS website.) Two good MACA sites can also be found at Edwards AFB and Davis-Monthan AFB. ✈

(Adapted from a HQ USAF/SE message.)

The recent eruption of Mt. Usu in Japan and the prospects of other imminent eruptions focus needed attention on a very serious hazard—airborne volcanic ash.

Normally, ash will be localized and can be avoided with careful attention by aircrews and weather briefers. However, when ash is present at upper flight levels, unpredictable global dispersal can occur and play havoc with air traffic.

For example, when Mt. Redoubt in Alaska erupted in 1989, a Boeing 747-400 suffered a four-engine flame-out and severe damage when it encountered an ash cloud. After Mt. Pinatubo erupted in 1991, at least 15 aircraft reported significant damage in spite of widespread warnings. Following the Mt. Saint Helens event, a C-130 inadvertently penetrated an ash plume 2.5 hours after the second major eruption. Sustaining extensive damage, it recovered with only two of its engines still operating.

Eruptions in Java (1982), Mexico (1982) and Italy (1983) all have similar tales. The remote El Chichon eruption in 1982 had very few near-term effects, but an incredible surge of seemingly unrelated window-crazing reports emerged over the following months. The main point is this: Volcanic ash is a formidable menace and aircrews must take deliberate avoidance measures to escape its effects.

The following information should help you avoid problems associated with ash. Remember: DOD and Air Force instructions, along with MAJCOM instructions, will take precedence over the following possible courses of action in the event of volcanic activity impacting operations.

A. Flight planning for flights in the vicinity of volcanic activity.

1. Contact base weather for current and forecast ash cloud positions—and stay 20NM away. If possible, maneuver upwind of a volcanic plume, even when flying outside 20NM.
2. Carefully review NOTAMs and air traffic control directives for current status.
3. Avoid destinations in areas of ash fallout.

B. Conducting preflights in a volcanic ash-covered environment. Carefully inspect the following areas:

1. Pitot tubes and static ports
2. Engine and ventilation inlets
3. Air scoops
4. Gear strut and hydraulic actuator chrome. Note: Do not wipe, rub or walk on ash-coated surfaces (i.e., top of fuselage, wings and/or horizontal stabilizer). Don't use windshield wipers to remove dust. Flush off with water and wipe with a soft cloth.

C. Ground operations in a volcanic ash- covered environment.

1. Minimize operations.
2. Do not use the auxiliary power unit for air conditioning. Restrict use to engine starts.
3. Once engines are started, use engine bleed for air conditioning.
4. Run air conditioning at full cold setting if dust becomes visible.
5. Do not use air conditioning packs during takeoff.
6. If odors become present, minor eye irritation may be expected. Remove contact lenses and consider the use of oxygen when

continued on next page

Do not wipe, rub or walk on ash-coated surfaces (i.e., top of fuselage, wings and/or horizontal stabilizer).

With prolonged exposure, engines may flame out due to erosion, blockage or air starvation.

odors or eye irritation occur.

7. Minimize thrust during taxi.

8. If possible, perform a rolling takeoff.

D. Flight operations. Airborne radar will not detect volcanic dust clouds; weather forecasts are occasionally wrong, and plumes may be hidden by other clouds. In IMC or at night, it may be difficult to determine if you're in an ash cloud or in regular clouds. Some tell-tale signs are:

1. Windscreens are frequently pitted so severely that they become translucent. In addition, abrasive cloud particles will sandblast the aircraft.

2. Airspeed indications may fluctuate greatly or appear unusually high or low due to volcanic dust blocking the pitot-static system. Be prepared with known pitch/power settings IAW the performance manual for "flights with unreliable airspeed."

3. An acrid odor similar to electrical smoke may be present.

4. A rise in oil temperature could indicate dust-plugged oil cooler(s).

5. Increasing EGT.

6. Torching from the tailpipe.

7. Volcanic ash/dust may be blown into the cockpit through the air conditioning system.

8. At night, St. Elmo's Fire and static discharges around the windshield are often visible. A bright orange glow in engine inlets frequently occurs.

9. At night, or in dark clouds, landing lights cast dark, distinct shadows in ash clouds (unlike the fuzzy, indistinct shadows that are cast against weather clouds).

10. Engines may surge, and/or lose thrust, as a result of dust build-up and blockage of the high pressure turbine nozzle guide vanes and the high pressure turbine cooling holes.

11. At first encounter, select idle power, if the situation permits. This will minimize erosion, glazing and dust build-up. Consider an immediate 180-degree turn to get back to clear air.

12. With prolonged exposure, engines may flame out due to erosion, blockage or air starvation. Follow restart guidance. Be prepared for delayed start and spool-up.

13. After a suspected encounter, advise the nearest air traffic control agency. Transmit PIREPS to the nearest military base. This is extremely important for timely warning to other aircrews.

E. Landing in volcanic ash-covered environment.

1. Ash may act similar to dry snow or loose sand. In dry conditions, it is subject to vortices from engines which may cause ingestion and subsequent damage. In wet conditions, ash-covered ramps, taxiways and runways should be treated as icy surfaces with appropriate operating techniques and precautions applied. Contact base ops or base weather for current runway conditions. If windshields are pitted beyond use, perform an instrument approach with a safety chase. Request the widest runway and declare an IFE.

2. These additional precautions should be taken.

a. Damaged landing lights will significantly reduce landing light effectiveness. Have the runway lights (not strobes) turned full up.

b. Limit reverse thrust to the minimum practical after landing.

c. Minimize ground operations and taxi thrust.

d. Consider clearing the active runway and having the aircraft towed.

3. Finally, if you inadvertently fly into ash, or suspect you have, make an appropriate entry in the 781A. Record altitude, location, duration of exposure, and any related malfunctions observed.

F. Maintenance considerations following exposure to volcanic ash. Aircraft inspections should be conducted IAW tech data with the following additional considerations:

1. Ash should be removed at the earliest opportunity. Do not wipe, rub or walk on ash-coated surfaces. Clean with water, wash using alkaline detergent (ash is acidic) and flood with water.

2. Air, oil and fuel filters and electrical generators should be checked more frequently.

3. Reduce time between oil change intervals.

4. Clean/replace air conditioning water separator bags.

5. Pitot-static systems should be cleaned by reverse blow-out.

6. Externally lubricated mechanisms like control cables, actuator rods, etc., should be wiped with a soft cloth. Avoid use of solvents.

7. Increase sumping frequency of fuel tanks.

8. Increase inspections for landing gear squat switch cables.

9. Consult engine manufacturer for specific power plant maintenance items. ✈

CROSSTELL, THEN CROSSCHECK

MAJOR ALVIN BRUNNER
53rd Weapons Evaluation Group
Tyndall AFB FL

In the safety business, we investigate and report mishaps to determine what hazards we missed that could have prevented the mishap. We then chase around the ORM loop and arrive at step six, supervise and review. At that point we check to see if the hazard is really gone or the risk is manageable. All too often, we don't truly go back to step one, identify hazards. If we do, then it's generally in the same area as the last mishap, HAP, or hazard. We need to crosscheck for hazards.

Pilots constantly crosscheck numerous flight instruments, position, and what's coming next in order to achieve the desired aircraft performance and mission objectives. Safety personnel should be no different. For example, while everyone is watching and worrying about F-16 engines failing, are we missing a problem with C-5 tires or AIM-9 guidance software?

The 53rd Weapons Evaluation Group (WEG) has a unique mission with a wide spectrum of hazards that can help illustrate this point. The 53 WEG provides aerial targets in support of the Weapons System Evaluation Program (WSEP) and other test programs, and hosts the air-to-air weapons meet, William Tell. Presenting sub-scale and full-scale radio controlled aircraft to be shot by TDY units with live air-to-air missiles is a mission loaded with risk. (Such risks include flying old F-4s, ensuring drone control frequencies are free from interference, an anxious second lieutenant firing his first live missile, and testing various missile parameters, just to name a few.) Additionally, the WEG has a Special Devices Flight that can manufacture just about anything a test mission may need. Special "D" bends metal, carves wood, makes circuit boards, paints, and has many industrial hazards associated with aircraft manufacturing. Therefore, our safety office cannot afford to focus on any one thing for too long without something else giving us trouble.

We must continually maintain our "safety crosscheck" because the various pieces and many parts of our mission are all related to or affected by some other part. The hazard identified in one aspect of the mission may well create a hazard in another area. A faulty part, coupled with complacency, followed by an installation error, leading to an in-flight emergency, acted on with a lack of proficiency, produces a mishap. This is how the "mishap chain" is built. I suspect there are several "chains" under construction at any one time.

Here's a real-life example of what I mean by using ORM then crosscheck. When a unit shows up for WSEP missile shots, the ramp becomes rather congested with aircraft and vehicles. I fly the E-9, a highly modified Boeing Canada (de Havilland) DHC-8 aircraft, the largest airplane assigned to Tyndall. I was taxiing out to support a WSEP mission and happened to notice that my aircraft's wingtip was rather close to a parked A-10's tail. We were on the taxi line and the A-10 was in its parking spot box. It still seemed close, so we cheated away from the A-10. Good thing we did. When measuring taxi centerline to aircraft, our actual wingtip clearance would have been only five feet. We needed 25 feet! The ramp was designed for F-15 use. Using ORM and working with our host 325 FW / SE, we eliminated the offending parking spots. The bad news was parking is a precious commodity, and maintenance vehicles now had further to travel, spreading the already problematic flightline vehicle traffic. The good news was this problem is a well managed hazard with a low risk factor. Speaking of traffic...the next day one of my NCOs noticed the weapon troops running weapons trailers through the busiest part of our parking lot next to our building. This is the crosscheck factor. The ammo troops wanted to get to the flightline easily and thought transporting weapons through our POV and pedestrian-filled parking lot, past our headquarters building, and through the TDY WSEP maintenance area was best. We used ORM, made a safe lane to the flightline, and solved the problem.

Our actual wingtip clearance would have been only five feet. We needed 25 feet!

When you read a mishap message or safety article you might ask the question, "How does this apply to my unit, my job, my mission, and what can we learn to do to prevent the next mishap?" The answer may or may not be obvious. When in doubt, CROSSCHECK. Like the pilot crosschecking his instruments to ensure proper aircraft performance, so should commanders and safety personnel crosscheck their programs, people and projects. Perform spot inspections. Inform your people of problems at other bases. Ask how things are going personally, or through surveys or both.

Bottom line: Be involved and interested in your unit's mission and daily work, but not a hindrance. Some may think safety is "nagging" by being too involved or asking too many questions. Then answer me this: In the heat of battle, what flight lead doesn't want his wingman to check his six... a lot? ✈

ANONYMOUS

There were these funny-looking smoke-stacks at 12 o'clock between me and the runway.

It was supposed to be a normal overseas deployment for our reserve squadron of F-16s. It almost turned into anything but routine—for me, at least.

Like most guys new to an aircraft, I had listened in RTU with rapt attention to the instructor's description of each new system and its interface with the rest of the aircraft. I passed the test, so of course I was proficient, knowledgeable and ready for any contingency.

Even the annual Instrument Refresher Course had highlighted potential problem areas related to the aircraft. In the F-16, there is an area of conflict related to the ILS and the fire control radar. This conflict, in certain situations, can lead to a false on-course, on-glidepath indication.

You guessed the thrust of this little story. I was on final at Kadena AB to Runway 23R, and everything looked normal. I had been using the ground mapping function of the radar just to get a look at the terrain and returns in the area.

At about 15 NM on final, I abandoned the radar look and began to concentrate on the ILS approach. After some initial chasing of the needles, the jet (it couldn't have been me) finally got its act together, and we started to fly a decent approach. All of this happened by 8 NM final, which is where I got complacent/lazy/inattentive and dropped most, if not all, of my normal cross-checks and concentrated on keeping the needles centered.

When we finally broke out of the clouds at 500 feet AGL, I got my first clue that just maybe something wasn't right when there were these funny-looking smokestacks at 12 o'clock between me and the runway. About then, two high-power tension line towers went from the 12 o'clock to 6 o'clock position of my aircraft. A large amount of power and pull put me back on the glidepath.

The only reason I'm writing this instead of being a smoking hole on final is that God looks after fools and fighter pilots. The moral here is threefold.

• Pay attention to the cross-check. Don't assume that because it looks right, it is!

• Know the system glitches. Every jet has 'em, and some folks have paid the price for not knowing 'em.

• On your next instrument hop, when you practice instruments, don't cheat yourself with just "one peek," and evaluate your own instrument techniques.

Oh, yeah. I've got over 3,500 hours of fighter time, 500 in type, so I'm not exactly your basic green bean! **IT** can happen to you! ✈

LT JOHN FLYNN, USN
VAQ-134

I have heard many of my fellow junior officers talk about rank in the cockpit. All of the senior officers say that there is no rank in the cockpit, but I am not convinced that our JOs truly believe this. On a number of occasions they have said that "LCdr such and such" wanted to do something and they felt uncomfortable with it, but went along with it anyway. I would ask if they even brought it up in the debrief. The answer would invariably be "No," and the reason would be "Well, he has more experience and he outranks me anyway." I get so upset with this attitude because I can't count how many times I have stopped somebody from doing something I did not like and rank had nothing to do with it. My life had everything to do with it.

My first experience with "rank in the cockpit" occurred when I was still a lowly inexperienced Ltjg flying with my first fleet squadron at an Air Wing Fallon Det in the mighty A-6 Intruder. It was towards the end of the three-week exercise, and I was running on fumes. As a good deal, the OPSO gave me a local area low level to fly with an Air Wing LCdr whom I had never met, let alone flown with, before. We had a standard low-level brief, man-up, and the flight to the entry point was uneventful. We started flying at 200 feet AGL with the radalt set to 180 feet. Time and time again, the pilot would say, "Here comes the ridge, I've got clearance." Then the annoying, "Deedle, Deedle, Deedle" sound of the radalt would go off. I was tired of this and said, "I don't want to hear that thing go off anymore." The LCdr promptly climbed to 250-300 feet AGL and maintained that for the rest of the low level. My "pucker-factor" went down considerably and I enjoyed the rest of the flight. After the hop, the LCdr was glad that I let him know that I was uncomfortable flying at that low altitude. There were no reprisals, badgering or saying that I could not hack it. Just a handshake and a beer or six at the club afterwards. I'm willing to bet that this LCdr does not even remember this flight or how it affected me for the rest of my career, or how much respect he earned from me. Why? Because I never felt that his rank outweighed mine in the cockpit, and he did not either. I still carry that flight with me every time I fly.

We need to do a better job teaching our inexperienced aviators to speak their mind freely in the cockpit. From what I've seen recently, I don't think we are doing that. But, because of that flight at Fallon, I was able to fly another day, and in fact, flew with that LCdr at another Air Wing Det and was totally comfortable flying with him at 200 feet. ✈

(VAQ-134 is a US Navy Expeditionary EA-6B squadron.)

I was tired of this and said, "I don't want to hear that thing go off anymore."

ONE ON ONE WITH THE SAFETY GUY!

CAPT KEVIN HARMON
80 FTW/SE

So you think you're pretty cool? Been there, done, that, got the shot glass. Well, I'm Safety Guy (SG) and I'm here to put the hurt on you. Here's a recap from my last match-up.

The buzzer sounds and the game is on! It starts off with an age-old argument, "Why should I clear? The big sky theory will protect me." SG comes back immediately with, "How about taking an inventory of how many airfields are along your route of flight on a low-level? Have you ever wondered what goes on at all those little airfields? If you were interested in finding out what was going on, where would you look?"

Cynical Aircrew Guy (CAG) says, "NOTAMs—duh." Then SG says, "NOTAMs for these small civilian fields aren't found in the military NOTAM system." Whoa! Game's in full swing and SG takes the early lead. SG: 1; CAG: 0.

"So how do you get NOTAMs for these airfields?" quips the SG. CAG, with a quick retaliation, says, "Call 1-800-WX-BRIEF for L and D series NOTAMs...duh." SG: 1; CAG: 1.

Then SG says, "Go ahead and call 'em." What CAG finds is most of these little private airstrips aren't even tracked on the FAA computer. Wham! SG: 2; CAG:1.

All right, gloves are off, CAG is fired up, and SG's a little too cocky at this point. SG proposes a case study and, rivaling the CAG's bad attitude, says, "Try calling to find out about any NOTAMs on Bishop Airfield." CAG finds out he could get NOTAMs for Bishop Airfield. The problem is, they would be NOTAMs for the Bishop Airfield near Houston. Crack! SG: 3; CAG: 1.

After clarifying what the Bishop Airfield CAG wants is in North Texas, Friendly Briefer Guy (FBG) looks in an airfield identifier book and finds the Bishop Airfield CAG wants is listed as 67TA. Nice shot by

The buzzer sounds and the game is on!

USAF Photo by MSgt Perry J. Heimer

CAG, but it's blocked wide by SG. SG takes a knee and concedes that FBG would be able to look on the computer at the daily NOTAMs for the correct airfield by using this identifier. So SG's lead takes a dent. SG: 3; CAG: 2.

But SG is not easily discouraged! It's not even halftime and SG still has the lead. Guess what? FBG tells CAG there aren't any NOTAMs for 67TA, but SG has a hidden weapon and just happens to know 67TA has a large parachuting operation going on there during the week with upwards of 40,000 jumps a year! Ha! Score: SG: 4; CAG: 2.

But CAG is one of the toughest opponents out there, so after a little investigation and calling around to a couple of different FAA agencies, CAG finally finds out how the system works. Apparently, when one of these little airfields has an operation going on (like parachuting) that happens on a continuous or recurring basis, the FAA puts it in a little book called the Airport/Facility Directory (copies of this are located in Base Operations). Boom! SG: 4; CAG: 3. It appears the momentum has shifted.

But SG is certainly not out of the race. He bounces back with "When was the last time you checked this before you flew a low-level?" Bam! SG: 5; CAG: 3. CAG says, "Good one, but now we know and we will keep one in the squadron for our aircrews to reference before they go fly." Cheap points, but SG's lead is narrowed. SG: 5; CAG: 4.

Also, by looking in the Airport/Facility Directory, CAG discovers information on airfields and items that might affect the safety of pilots flying into or by these airfields. Ouch, that's going to leave a mark! SG:5; CAG: 5.

CAG has managed to tie the score—nice job. The only problem is, SG is about to bring out the Big Hurt. "Guess what?" says SG. "None of the small private airstrips like the one in our example are published in the Airport/Facility Directory." Wham, that had to hurt! SG: 6; CAG: 5.

The Directory does carry the parachute jumping areas and other special notices, but finding the information is challenging. So how does CAG even the score with SG? CLEAR! CLEAR! CLEAR!

That's the main point of this article—if you haven't already figured it out. It's very difficult to find all the information out there on every airfield we fly by on low-levels. It took about two hours just to find all the information in this example of Bishop Airfield.

Second, since it is difficult to find the information on these small airfields (if it's there at all), you have to remember to keep a good visual lookout going when flying in their vicinity. Take a look at the map (left) and guess what? You can always consider yourself in the vicinity of small airfields. Remember, don't just look left, right and down, but up, too.

Finally, a good technique would be to treat small airstrips as threats and avoid them if at all possible. A civilian sectional can help you with this, because parachuting, glider flying and other special use areas are printed on the sectionals.

Keep all this in mind next time you fly a low-level, and remember that some good planning can go a long way in ensuring a safe flight.

Fly safe, clear, and all potential match-ups with SG will be shutouts. ✈

Remember, don't just look left, right and down, but up, too.

"I'M NOT YOUR RADIO

LCDR CHARLES A. STERNBERG
Courtesy *Approach Mech*, Nov-Dec 96

I overshot the runway, holding the gear for the last minute.

As we taxied back to our line, I replayed in my mind the sequence of events that had just transpired, and I was disgusted. How in the world could two experienced aviators get themselves into such a situation? Together, my instructor pilot (IP) and I had more than 3,000 hours in tactical jets, not to mention another 1,000 hours as test pilots.

This sortie had been a test pilot's dream. I was finishing up the high angle-of-attack and spin phase at the U.S. Test Pilot School at Edwards AFB. This flight was the "phase graduation" hop—a demonstration and investigation of the F-16 deep-stall phenomenon, both upright and inverted. The substantial preparation included many hours of academics, flight profile workup, risk assessment, and hazard analysis.

My instructor was an experienced F-16 test pilot who had recently reported to the school. I was a fleet-experienced, 1,500-hour F/A-18 pilot with 20 hours in the F-16.

After start-up, I taxied us out, launched, proceeded overhead to the spin area and did the mission. As soon as I had finished manually pitch-rocking the Viper out of the last inverted deep stall, the IP told me we had a "simulated" engine flameout (SFO). I configured the aircraft for the flameout condition and headed for the lake bed for an emergency landing. Once established in the glide, I reassessed my energy state and confirmed that we could make it to the duty runway. I headed for high key, but the radios were clobbered as I tried to check out with range control and check in with tower. The pattern was clear, so I kept coming.

The instructor cluttered the ICS with advice, technique explanations, and assessments of the SFO. I finally checked in with tower after passing low key on my way to final, and at this point I was starting to feel behind the aircraft. During a relatively lengthy and distracting dialogue with tower as to who I was and where I came from, I was deep and slow. I overshot the runway, holding the gear for the last minute. Having difficulty seeing the runway from the backseat, I overshot the comeback and rolled out left of centerline. I was not too impressed with my SFO so far.

There I was—on final on the back side of an SFO during my first backseat landing in the F-16. My last F-16 flight had been about 4 months earlier, and this baby was tough to land for the inexperienced, even from the front seat. I was still slow and deep. The gear was in transition, I was working

through the landing checks, and I was trying to get clearance from tower to land. Oh, by the way, I was approaching the flare point. I was sure that although my technique was not pretty, I had accomplished the critical tasks. The gear was down with checklist completed, I had clearance to land and was correcting toward centerline.

The IP then injected, "We're still lined up a little left, but we're okay, a little on the slow side. We want to have some energy to flare."

"Roger that," I replied. "Okay, yeah, runway made, 150 knots, all right, here comes the flare."

I started the flare a little high and pulled the remaining power off a little too early, but at least I was on centerline now. As the airspeed bled off and we started to float, I was fighting to coax the Viper down onto the deck.

At that point, I felt the throttle move quickly to military. As the aircraft climbed away from the runway, the IP said, "Well, no need to try and salvage this one. No big deal. We don't need to press it."

In disgust, I slammed both my arms against the canopy, then rested them on the canopy rails as I chastised myself for having flown an approach so poorly that the instructor had to take it from me.

Some test pilot I turned out to be!

The IP asked me to call tower and get clearance for the closed pattern. As I did, I thought to myself, "Why are you asking me to call? You're flying the jet. I'm not your radioman!"

As the jet continued a gradual climb, I wondered why we weren't leveling off for the low transition, which typically preceded the pitch-up to the closed pattern. Tower cleared us for an extended closed pattern, which meant a little more straight-and-level driving time before the left-hand pitch-up.

As the aircraft climbed through 1,000 feet AGL on runway heading, I noticed the wheels were still down. The IP interrupted the silence with, "Normally we put the wheels up when we pull for the closed, but I understand that whole Navy thing."

"Yeah, I know, heh, heh," I acknowledged, but I was puzzled. I thought, "No kidding, Sherlock, I've been flying these closed patterns for 11 months. I know that. So why haven't you put the wheels up?"

We were now approaching 290 knots, and the gear speed was 300. As I kept wondering, his next call was, "Didn't we get cleared for the extended closed?"

"Yes," I answered, and again thought, "So, why haven't you turned? We should have turned 15 seconds ago."

continued on next page

"So, why haven't you turned? We should have turned 15 seconds ago."

There, in front of me, was the IP, comfortably resting with his arms on the canopy rails!

At this point, the aircraft was approximately 3 degrees nose up and still gradually climbing, wings level, on runway heading approximately 1.5 miles upwind.

He then called over the ICS, "Well, we really don't want to overspeed the gear."

I replied, "Nope, don't want to do that," and again I thought, "So, why don't you slow down and turn?"

A few seconds later, the aircraft started a slow roll to the right to about 15 degrees right wing down, the nose dropped to approximately 5 degrees nose down, and we started descending.

"What the heck is this guy doing?" I thought.

Instinctively, I peered around the front ejection seat to satisfy my curiosity, and I had my answer as my heart skipped a beat. There, in front of me, was the IP, comfortably resting with his arms on the canopy rails! I immediately grabbed the sidestick, took control of the aircraft, leveled the wings, raised the gear, and told tower that I was turning crosswind for a full stop. All was quiet in the cockpit, my adrenaline was pumping, and I realized that the IP had no idea that for the last minute and 15 seconds, no one had been flying the airplane!

I decided that the best course of action was to deal with the task at hand, which was landing, and save the discussion for the debrief. I landed—a nice one this time from the backseat—rolled out, taxied back, and shut down.

In the debrief, I broke the news about the "guest" pilot we had for that 1 + 15, and the IP stared at me in disbelief.

"You what? You've got to be kidding me!" A very long discussion followed.

We made many mistakes. I was disappointed in my own flight discipline, especially since I had been an A-4 instructor pilot and had dealt with "positive control of aircraft" issues in great detail. Obviously, I had gotten sloppy, and we had broken some cardinal rules.

What had happened to always maintaining positive control of the aircraft? "You've got it," "I've got it," "Roger, you've got it." We had successfully changed control out in the area during the deep stalls several times

USAF Photo

without incident.

Why hadn't we done it properly this last time? Breakdown in communication, lack of assertiveness, and task saturation of the pilot in the rear cockpit. The F-16 provides no direct feedback between front- and rear-sidestick controllers and rudder pedals. The only control that moves in the front as well as the back is the throttle. Therefore, control of the aircraft cannot be determined or verified by watching stick or rudder-pedal motion.

Also, there are no mirrors in the front cockpit that let the IP see what is going on in the rear cockpit.

Whatever happened to the adage that the person flying the airplane talks on the radios? Why had that not alerted me to the problem? What about moving control surfaces, throttles, or wheels when not in control of the aircraft? And most significantly, why were we thinking to ourselves and not talking to each other? These omissions fall under the ACT category of assertiveness. I was reluctant to put him on the spot in deference to his experience as a test pilot and my position as a student. He, in turn, didn't want to treat me as a knucklehead student or challenge my actions in deference to my experience. Instead, he tried to give polite hints to influence my supposed control of the aircraft.

My first thought was that it wasn't my fault. He moved the throttle and set this chain of events into motion, but we hadn't talked to each other about aircraft control. I had simply relinquished control because I thought he had taken the aircraft.

Lack of assertiveness and being too polite will kill you. Have the guts to iron out the confusion when it arises instead of trying to take the easy way out by trying to avoid a potentially embarrassing situation. Barney has no business being in the airplane!

For 1 minute and 15 seconds, General Dynamics, luck, and a bunch of ones and zeroes flew our F-16 from an aborted touch-and-go at 10 feet AGL and 150 knots to 2,500 feet AGL, 290 knots, and 3 miles upwind. ✈

Lack of assertiveness and being too polite will kill you.

25,000 FEET AND

LT EDDIE HA, USN
VAQ-134

The only problem I had was the small leak across the bridge of my nose…

Even though it was a routine Operation NORTHERN WATCH (ONW) mission, I was actually excited about it. I was ECMO1 in the lead jet of a section of Prowlers. This would have been my pilot's first flight into the Northern Iraq AOR and the first time back in ONW for the rest of the crew since our previous deployment. Having flown a couple of flights into the AOR prior to this, I looked forward to leading the crew through the ONW procedures.

From the time we walked, things did not go as planned. As we taxied, Dash 2 called and said they would need to jump into the spare. We pressed on, leaving our wingman to coordinate his own takeoff. Our tanker then called, saying they were working an aircraft problem. Our planned takeoff time came and went, but we held on deck until our tanker actually took off. To top things off, the package commander was also experiencing a delay. I thought, "Great! Our first chance to fly in a week, and things are falling apart already."

Eventually our tanker taxied and took off, and we followed. As we were climbing for our assigned altitude of FL250, the pilot completed the climb checks and I snapped off my mask to take a drink of water. Having taken off right behind the tanker, we were only 15 miles behind it. I thought, if we can find him during the climb and join up at FL190, we would not need to continue up to FL250.

Passing FL150 (flight levels begin at 6000 feet in Turkey), I felt a little lightheaded and asked for the cabin pressure. The response from the pilot and ECMO2 was "15,000 feet." I immediately put away my water and resecured my O2 mask as we leveled off. The oxygen quantity showed 24 liters and we were getting good flow. After some discussion, we came to the consensus to continue while troubleshooting the problem.

We leveled at our assigned en route altitude, FL250. Cabin pressure was at 25,000 feet. We checked circuit breakers and recycled switches to no avail. Everybody was feeling fine so I resigned myself to accept the current situation and focus on finding the tanker. The only problem I had was the small leak across the bridge of my nose but I was breathing OK and felt fine. If we could

USAF Photo by SrA Greg L. Davis

just find the tanker then we would be cleared down to join at FL190.

With my attention totally focused on finding the tanker, which was showing five DME on the air-to-air tacan, I had forgotten about the CABIN PRESSURIZATION FAILURE checklist. ECMO3 finally reminded me of it and read it off. Still no luck. At four DME on the tacan, I saw a glint off our nose, about 20 degrees below the horizon. I reached for the handle on the canopy bow with my right arm to pull myself up for a better view. Within seconds, my arm went numb and the single glint turned into multiple targets. I felt lightheaded and tried figuring out which glint was the real tanker. I realized my situation and 'fessed up to the rest of the crew. ECMO3, the mission commander, immediately decided to abort the mission as I shoved the O2 mask tighter on my face. We turned around and executed an emergency descent to FL100. The rest of the recovery was uneventful.

Once on the deck, I went to see the flight surgeon. He did a checkup and put me on 100% O2 for an hour, just in case. Having had a decompression sickness episode during a previous chamber ride, I was sure I had the symptoms again. Luckily, I was only mildly hypoxic, but decompression sickness could have easily and quickly developed from the hypoxia at FL250. The decompression episode I had prior was a mild case but it was very painful, feeling like thousands of needles in my left shoulder area.

Thinking back, there were a couple of things I could have done to alleviate my hypoxic episode. I knew my mask did not fit properly from previous use. It was loose and air leaked past the bridge of my nose. I should have spent a few extra minutes with the PRs and had it properly fitted. You can get by with a few things not working 100%, but breathing properly is pretty essential no matter what you're doing. The other thing—I was getting too wrapped up about the mission. ONW is "real world" stuff, but without degrading the overall package too much, our wingman alone could have covered the AOR. My training paid off in that I quickly recognized the onset of hypoxia, and, once confirmed, our mission commander took charge and got us home. If there's any doubt, there's no doubt. ✈

(VAQ-134 is a US Navy Expeditionary EA-6B squadron.)

I felt lightheaded and tried figuring out which glint was the real tanker.

Courtesy, Directorate of Flying Safety, Australian Defence Force

Management of flying safety in the Luftwaffe during WWII

It was usually SOP...

There has been much focus in recent years on the responsibility of management in flying regulations, the prevention of aircraft accidents and the promotion of flying safety generally. Accident investigators tend to look a lot closer at flying accidents that, on reading about some accident occurring somewhere, one can be forgiven for too easily applying the label "pilot error."

Observing the passage of time that has elapsed we can, perhaps, look back with tongue in cheek a little at how flying safety was managed (and the processes employed) in one air force during WWII. The incidents cited in this article were extracted from captured German Air Force flying safety records.

At the beginning of WWII, Reich Marshal Hermann Goering gave each *flieger* the one-time word on the subject of violating flying regulations while in the employ of the Luftwaffe. The German Air Force accident or violation report was officially known as a *Disturbance Report*. When a pilot got his

name on one of these reports, it was usually SOP to give him a large boulder, a hammer and a five-year plan to convert the boulder to sand.

The Reich Marshal took a dim view of anybody in his air force who violated regulations, and in a letter to his commanders in the field Goering said, "I order that in cases of flying order and discipline, the disciplinary superiors will take merciless action with the utmost strictness against the guilty ones and advance their education as flyers with all means at their disposal. They will be responsible to me to see to it that the efficiency of the troops will not be weakened due to careless accidents."

His order of "merciless action" worked two ways. If a superior failed to take action in cases of infractions, or if he did and the action was not severe enough, then Hermann had two candidates for the rock farm.

To cite examples of how flying safety was prompted in the Third Reich, the following should suffice.

Irresponsible Aircrew

Lieutenant Engler, a pilot attached to one flying school, received five years in prison and reduction in rank. On a navigational flight he temporarily permitted the flight engineer to take over the controls and then made turns below the prescribed minimum safe altitude over a town. Following this, Engler flew up a valley where, due to downdrafts, the aircraft could not be climbed over a ridge; the aircraft crashed after clipping a tree and was destroyed. Four occupants were killed and two seriously injured.

Then there was the case of Lieutenant Schmidt of the Blind Flying School. He got one year in prison and reduction. On 12 June 1941, he was ordered to fly a JU-52 from Gardemoen to Neuruppin. During the first intermediate landing in Copenhagen he neglected to refuel. He pulled the same trick after landing at Prenzlau. Some 15 minutes after taking off from Prenzlau, his aircraft's engines failed due to fuel exhaustion. An attempted forced landing was unsuccessful and the aircraft crashed in a forest injuring three of his crew.

Not to be outdone by his Luftwaffe cronies, Lieutenant Kornblum of the 10th Squadron Bomb Wing, during a cross-country flight from Lille to Brussels, flew low-level without authority. While flying over a bridge at an extremely low altitude, the aircraft struck a telegraph wire which, due to the damage suffered by the aircraft, necessitated an emergency landing. Still not to be outdone, his superiors gave him six months at a lower altitude yet.

Misguided Student

Student pilots, too, had their "15 minutes of fame" in the GAF. Lieutenant Schaefer, a student at a training establishment at Pardubitz, was "awarded" eight months in prison and reduction in rank for his misdemeanor. Apparently, after failing to "gas up" at his home base, he took off and promptly deviated from his flight plan, without authorization, to land at another base to refuel. Coincidentally, relatives were residing nearby and, after carrying out a good number of steep turns at low level over their property, he landed back at the refueling base, returning by road to visit his relatives.

In another "relatives" incident, Lieutenant Klein and S/SGT Satow of Special Purpose Bomb Wing No. 1 got four months and two months in the pokey, respectively. Lieutenant Klein, as commander, and S/SGT Satow, as pilot, were on a delivery flight and made an intermediate landing in Prague-Rusin. While there, they had the opportunity to visit a relative who expressed a burning desire to go for a flight. Following an initial refusal, a flight was made under the pretext of a communications or a local weather flight, and three buzzin' cousins were taken along who were not members of the Wehrmacht. During this flight, the passengers were treated to a no-doubt enjoyable, but nevertheless unauthorized, low-level trip.

The fact that even threats of incarceration failed to impress irresponsible GAF pilots suggests there are many ways of moving men, but only one way that may be depended upon to bring about the use of sound judgment and dependability. You can push people around with a strong arm. You can overwhelm them with authority. You can stampede them with fear. You can confuse them with falsehood. You can wear them down with endless argument. But the only way of making men obey regulations willingly and effectively, and of keeping them moving in the right direction, is to impress them with the responsibilities and liability entrusted to them, so they will stay on the straight and narrow of their own free will.

Isn't that the way it ought to be? ✈

...to give him a large boulder, a hammer and a five-year plan to convert the boulder to sand.

LESSONS THAT MAY SAVE YOUR LIFE

USAF Photo by Walt Weible

COL JIM SKALKO
Courtesy *Torch*, Nov 99

All I could see was a windscreen full of ground.

Life has its defining moments. Being a member of Air Education and Training Command's team for the last 20 years, three such moments changed my flying career forever.

Trick Or Tweet

During my first year as a T-38 instructor pilot at Columbus AFB, Mississippi, I experienced my first "defining moment." At that time, I considered myself an experienced pilot with more than 1,000 flying hours and nearly 90 hours of instructor time.

The incident happened during a routine formation sortie. As we approached the route position, it all hit the fan. Suddenly my student pilot screamed, the aircraft rolled inverted, and the student aggressively pulled back on the stick! All I could see was a windscreen full of ground.

I wrestled the stick from the student, rolled upright, and recovered the aircraft from a nose-low attitude. After a few confusing moments, I safely landed the aircraft.

Once we were back in the flight room, my student calmed down enough to explain what had happened. A T-37 Tweet descended from behind us through our formation!

Apparently, the T-37 pilot didn't see the T-38 formation underneath his aircraft as he descended toward a low-level entry point.

Lesson #1: If you become complacent in a student pilot training environment, you may get welcomed to this command like I did.

Up In Smoke

My second defining moment came when I didn't fully understand the amount of risk I assumed as a runway supervisory unit (RSU) controller directing air traffic.

It was a typical flying day at Columbus. We had seven aircraft in the overhead traffic pattern. Then a four-ship reported initial, and the observer informed me the lead was a solo student pilot. When the lead aircraft

rolled off the perch, its right flap hung up. The aircraft continued to roll. It was out of control.

I saw orange flames shoot out from the front cockpit and a parachute streaming from behind the student as he ejected. The aircraft descended below the tree line, and a large cloud of black smoke filled the air. In the relative same location, the student, dangling on the end of his parachute, also dropped below the tree line.

I froze momentarily.

How do I control a pattern with a burning aircraft on the ground in the final turn?

The RSU crew stopped functioning while they waited for guidance from me. I was trying to comprehend the implications of the accident while deciding how to safely recover the 10 remaining aircraft in the pattern.

The aircraft pilots were trying to help the recovery effort by reporting what they saw as they flew over the accident site. I grew concerned that I would lose another aircraft because the crews were getting distracted in the final turn.

While I won't go into the details of how I recovered the remaining aircraft and how we assisted the downed pilot, it went fairly well. The student survived the crash. And there were no other accidents in all the commotion.

Lesson #2: Think through the scenario ahead of time, thoroughly brief the proper procedures to those responsible for the actions, and follow the appropriate checklists.

A Fatal Error

My final defining moment happened when I was a T-37 operations officer at Sheppard AFB, Texas. As I was walking to my aircraft, I saw a T-38 in a slow roll. It zipped overhead at about 300 feet. I could see the squadron decals on the instructor pilot's helmet as the aircraft flew by inverted. The aircraft then descended and impacted the ground. As the aircraft hit, the T-38 Talon seemed to collapse into a ball of fire and black smoke.

The Accident Investigation Board later explained what had happened. The student was on his initial T-38 syllabus sortie. During the second touch-and-go, he allowed the aircraft to approach a stall during the flare.

Although the instructor took control of the aircraft, he didn't follow established go-around procedures. When the wing dropped in the flare, he first attempted to adjust the flaps to decrease drag on the aircraft and then went to afterburner. However, he never used full afterburner, so he was unable to safely recover the aircraft.

Every instructor must make the personal decision, "When do I intervene?" If you intervene too soon, you "cheat" the student out of training. If you delay the decision, you may jeopardize the safety of the flight.

Lesson #3: Share your techniques with other instructors to improve the overall quality of instruction and safety in our flying training programs.

The Bottom Line

I hope that by sharing these experiences I'm able to prevent a training incident from becoming a "defining moment" for you. Fly Safe! ✈

(Colonel Skalko is assigned to HQ AETC, Randolph AFB, Texas.)

I could see the squadron decals on the instructor pilot's helmet as the aircraft flew by inverted.

FORECAST FOR DISASTER

USAF Photo

CMSGT ROBERT T. HOLRITZ
Technical Editor
Flying Safety, Sep 90

A loud bang was followed by the noise of fuel rushing from the main tank.

Aircraft 129 was on the refuel pad for a refuel and leak check after fuel cell maintenance. Two hours into the operation, the fuel system specialist in the cockpit heard a sound like an aluminum can being crushed. Seconds later, the same sound was followed by a groan from somewhere toward the rear of the aircraft. Then, a loud bang was followed by the noise of fuel rushing from the main tank. The fuel specialist on the ground confirmed a massive fuel leak and told the specialist in the cockpit to shut off power and "get the hell out!"

Another fuel specialist, who was acting as fire guard, shut the power unit off. A sheet metal specialist, working on an engine cowling, saw the wall of fuel and leaped from his ladder just before it was knocked over by the deluge. The fuel truck operator immediately shut off the truck and evacuated. A blue flame started from under the wing and quickly engulfed the entire forward fuselage of the aircraft, knocking down the sheet metal specialist in the inferno. The fuel specialist, who had been in the cockpit, sloshed through the fuel and made it out of the spill area just seconds before it ignited.

Although the fire department responded within 2 minutes, the aircraft was a total loss. In less than 30 minutes, the fire had destroyed an aircraft, a fuel truck, and a power unit. Worse, it resulted in severe injury to a fuel specialist and the fatal injury of a sheet metal specialist.

The massive fuel leak and fire were the result of an overpressurization caused by refueling the aircraft with a fuel vent plug installed. The following is the sequence of the events which led to the disaster.

Shortly before 1100, the aircraft was towed to the flightline for a final leak check after major fuel system maintenance. As part of the aircraft preparation, a young fuel system specialist installed a fuel system vent plug to allow the system to be pressurized during the check. Since this was the first time he performed this task, he didn't notice the red maintenance streamer was missing from the plug. After he installed the plug, he notified his supervisor, who then made the appropriate red X entry in the aircraft forms. The leak check was negative, and all equipment was removed—all except the vent plug.

During shift change, the day-shift supervisor briefed the swing shift the leak check had been complied with, and all that remained was to refuel the aircraft. The swing-shift supervisor, a MSgt, had 15 years' fuel shop experience, but less than a month on this type of aircraft. There were two other fuel specialists also working the aircraft on swings—a SSgt with 2 years' experience (but notorious for violating tech data and taking shortcuts) and an airman just out of tech school. It was obvious the

fuel shop NCOIC had put all of his shining specialists on day shift and sorely neglected swing shift.

The MSgt called for fuel trucks. During his review of the aircraft forms, he noted the open red X for the vent plug being installed. He directed the airman (inexperienced) to climb on the backbone of the aircraft and check to be sure the plug had been removed. The airman had not performed the task before and was unfamiliar with the vent plug. However, since there was nothing which looked like a plug inside the panel, and since there was also no red streamer as called for in the T.O., he assumed the plug was removed. He then notified the supervisor who signed the entry off in the "Inspected By" block.

The stage was already set for disaster. However, it was compounded when a sheet metal specialist was granted permission to work on an inboard engine cowling, in spite of the fact the T.O. states "All personnel not required to perform the fueling operation shall be evacuated from the area."

After the fuel truck arrived, the supervisor made final checks to ensure the aircraft was ready. Probably because he was unsure of what he was doing, he failed to have the fire department standing by as required by the T.O.

The refueling operation continued until approximately 2,000 gallons of fuel were pumped into the main tank. The supervisor noticed the aircraft was extremely slow to take on fuel, but since he was new on the aircraft, he thought this was normal. About an hour into the operation, the specialist in the cockpit heard a bang (which was caused when a 4-foot section of the main fuel tank blew out).

In only a few seconds, nearly 2,000 gallons of JP-4 poured out of the aircraft. The fire guard shut off electrical power, and the fuel truck operator shut the ignition off. Up to this time, there was no fire. Then, when the wall of fuel knocked over the sheet metal specialist's ladder and the tool box on top, it generated a spark which ignited the fuel.

The basic premise in the Air Force's mishap reporting system is to learn from the mistakes of others. In fact, we, at the Air Force Safety Center, know there are very few mishaps which are not an echo from the past. Perhaps it's because we don't think it can happen to us, or maybe we just don't get the word, but for some reason, many of us don't take advantage of the warnings provided by mishap reports. Unfortunately, a heedless attitude toward mishap reports continues to cost us dearly in both assets and human suffering.

In the past 10 years, there have been eight major mishaps involving fuel system vent plugs. As a result, two aircraft were destroyed, one sustained major damage, and five others received minor damage. Tragically, there was one fatality. Total cost was $35 million. The senseless thing about these mishaps is, except for the names, aircraft and places, the mishaps are almost identical. Failure to follow tech data, poor tool control, inadequate training and poor supervision were factors.

Fortunately, the mishap depicted in this article did not actually occur. Not yet. But it doesn't take a state-of-the-art computer to figure out that unless supervisors intervene, the mishap described above will occur, almost exactly as portrayed, in the very near future. Bet your career? Bet your life? ✈

He failed to have the fire department standing by as required by the T.O.

F = P X A
Formula for Disaster

The consequences of leaving a fuel vent plug installed during refueling can be, and usually are, horrendous. An 80-square-foot hole in the fuselage of a bomber, and the wing of another bomber broken in half are some of the more notable results. Where does the tremendous force required to cause this catastrophic damage come from?

The answer is in a simple formula well known to all pneudraulic specialists.

F = P X A

Where F equals the force generated, P is the pressure, in pounds per square inch (psi), and A is the area the pressure is acting on.

Consider this: Most fuel tanks are designed to function at a pressure no greater than 5 psi. At this pressure, a 1-square-foot area of the fuel cell wall is subjected to 5 psi X 144 square inches, or a force of 720 pounds. This pressure is rarely exceeded because fuel systems are vented to prevent pressure buildup. But, with the vent clogged or sealed, pressure rapidly builds up.

Since refueling hose pressure for most large aircraft is in the neighborhood of 20 psi, this would create a force of about 2,800 pounds per square foot which will cause a catastrophic failure! ✈

OPS TOPICS PRESENTS...

Felonious FOD and Wrecked Wingtips

Paper FOD, Act One

Once the training sortie was complete, the T-38 Talon taxied clear of the active to complete after-landing checks. At about the same time the two crewmembers opened their canopies, the No. 2 engine compressor-stalled. The student pilot noted No. 2 EGT rising rapidly, and immediately shut down both engines and declared an emergency.

Once the emergency was terminated and the crew had an opportunity to catch its collective breath, they realized one of the approach plates was MIA. But not for long. Turns out the missing approach plate had fallen out of the cockpit when the canopies were opened and been sucked into the No. 2 intake. Since No. 2 engine EGT had peaked at 1000 degrees C, all turbine blades and second stage baffles had to be R&R'd.

You may say, "Balderdash! No way could a 'soft' foreign object cause engine damage!" We say, "Think again." That's how "soft" FOD—paper—knocked an aircraft out of commission.

Paper FOD, Act Two

The T-38 four-ship advanced formation training ride had been relatively uneventful until after landing. The mishap crewmembers (MC) completed postflight checks and opened their canopies on the way back to parking. No sooner had the student pilot turned right onto the parallel taxiway and bumped the throttles to 65 percent, than No. 2 engine RPMs rolled back to 50 percent, and the engine exhibited compressor stall characteristics.

USAF Photo by SSgt Andrew N. Dunaway, II

The IP took control of the aircraft to try his hand at it diagnosing the problem and confirmed there was a compressor stall-like problem.

The student pilot and IP taxied the aircraft back to parking, shut down and told maintenance about the problem they had experienced with the No. 2 engine after landing. The MC then conducted their postflight walkarounds, noting nothing out of the ordinary.

But maintainers conducting *their* basic postflight inspection did, and impounded the Talon. The No. 2 engine had been compressor-stalling because there was an approach plate lodged between the three and six o'clock positions of the front frame.

In-shop examination of the engine revealed several inlet guide vanes and first stage blades damaged beyond local repair capabilities, so the engine was sent to the ERRC (engine regional repair center) for overhaul.

Turns out the approach plate belonged to the MC. Hmmm… Who says lightning never strikes twice?

Taxiing On Dangerous Ground

The C-5 landed uneventfully at Cairo West and was maintaining radio communications with both Cairo West Tower and a TALCE (Tanker Airlift Control Element) deployed there.

But, due to confusion resulting from the Cairo West Tower controller's poor command of the English language and instructions he gave that were contrary to the ASRR (Airfield Suitability and Restrictions Report), TALCE instructions that didn't agree with the ASSR and a pilot who had only recently been entered into aircraft commander upgrade with little taxiing experience, the Galaxy found itself in close proximity to a small, 14 ft high building near the runway on the copilot's side. Nevertheless, the crew continued the taxi without benefit of a wing walker to verify wingtip clearance… And struck an antenna pole attached to the building with the right wingtip.

Fixed Object 1, Aircraft 0.

USAF Photo by MSgt Perry J. Heimer

"Wingtip Walker?!? We Don't Need No Stinking Wingtip Walker!!!"

As with the previous Ops Topic short, this mishap also took place at an unfamiliar airfield. The C-141 channel mission was delivering some cargo to Keflavik NAS. Upon nearing Keflavik, the aircrew reviewed appropriate information pubs, including the ASRR summary. Keflavik weather was reported as scattered clouds at 3000, broken ceiling at 5000, snow showers and blowing snow.

After landing, the aircraft received instructions from Keflavik Tower to taxi to the end of the runway, turn left

USAF Photo

onto taxiway "Sierra Four" and then contact Keflavik Ground.

Instead, the Starlifter turned off 2000 ft short of the end of the runway, exiting onto "Alpha," a high-speed taxiway. Once on Alpha—which had lighted "No Entry" signs posted on each side—the crew contacted Ground. Ground radioed "Taxi via Sierra, cross Runway Zero-Two, Follow-Me (vehicle) will be picking you up on the other side of Zero-Two, taxi behind them to parking" instructions to the crew.

Consulting their airfield diagram, the crew verified the Alpha taxiway they were on would intersect Sierra taxiway and pressed. But space was getting tight.

As they continued the taxi, there was one area where the pilot had to taxi well left of the centerline to clear a light pole. After steering back to the centerline, it became obvious that available taxi space between a hangar to the left and the paved surface on the right was narrowing.

The scanner behind the pilot requested that he slow down. The pilot slowed, scanned the left wing himself and continued the taxi. And the left wingtip brushed through a corner of the hangar. The pilot stopped the aircraft and deplaned crewmembers to assess the damage.

Mishap cost: $42,000. Final score? Fixed Object 2, Aircraft 0.

In 1986, a taxiing C-141 struck a light tower near the parking ramp. The strike opened up the No. 1 main fuel tank and started a massive conflagration that resulted in nearly $2.5 million damage but, fortunately, no fatalities.

Neither the C-141 in this Ops Topic nor the C-141 involved in the Class A mishap deployed a scanner. Hmmm… 'Nuff said? ✈

Maintenan

Maintenance Matters Presents...

Ruminations on Tech Data and Safety

Stuff Falling, Act One

Two maintainers were removing the APQ-175 radar system antenna from a C-130 AWADS (Adverse Weather Aerial Delivery System) aircraft. If you aren't familiar with the APQ-175, it's an older technology system, and older technology system components tend to be bigger and heavier than newer generation radars. The antenna is a good case in point, weighing in at about 175(!) pounds. Natch, it's a two-person job to install or remove one.

APQ-175 support equipment includes a hoist that's used in antenna removal. The hoist assembly has rails that, when locked into position, permit the antenna to be slid forward for easier removal. The hoist assembly support arm rails are held in position in their mating holes with spring-loaded locking thumbscrews. The 1C-130E-2-8-1 tech order covers use of the hoist assembly and it contains a "Warning" that states, in part, "Inner rails must be extended inward and locked into position, otherwise antenna will slip between rails."

The maintainers installed the hoist assembly, removed the antenna mount bolts and proceeded to slide the antenna onto the hoist assembly… When one of the support arm rails shifted and the antenna fell a couple of feet to the maintenance stand they were using. Luckily for the two maintainers, no feet or legs were in the antenna's ballistic path. *Unluckily* for the antenna, after a few brief moments on the stand, it fell an additional four feet to the ramp.

Following this mishap, a suggestion to allow a longer shaft on the spring-loaded thumbscrews was submitted. The longer shafts would make it easier to ensure the hoist assembly rails are firmly (and completely) locked in place.

Granted, following tech data to the letter is always crucial. But if the tools or support equipment you use could be made safer or more reliable, then why not submit your improvement ideas on a suggestion form?

Stuff Falling, Act Two

Three C-130 Propulsion troops were tasked to mate a lower QEC (quick engine change) kit (about 6' long X 1'4" high X 1'3" wide X 150 lbs) to an upper QEC kit that was secured to an engine stand.

With two troops at the aft end and the third troop at the forward end, the three of them gave a mighty "Heave Ho!" and lifted the lower QEC kit from its dolly. The two troops at the aft end temporarily secured it to the upper QEC kit with a pair of adjustable pliers, and had just started moving to the forward end to help their coworker when the pliers went "Sproing!" And the solo troop suddenly found himself the only force preventing the lower QEC kit from obeying the law of gravity and crashing to earth.

The solo troop was able to prevent damage to the lower QEC kit and the engine stand, but the heroic effort didn't come without cost: He hyper-extended both wrists and ruptured a tendon in his thumb that took two surgeries to correct.

Hindsight being what it is, here are a few questions worth pondering. Do you s'pose there could have been a better way to support half of 150 lbs. than a pair of adjustable pliers? Do you s'pose a little foresight could have prevented this troop's injuries? And finally, do you s'pose after this mishap occurred the shop found a better, safer way to mate upper and lower QEC kits? The correct response to all three questions is "You betcha!"

Finally, one more question to think about: Are there potentially unsafe practices taking place in your workcenter that you could make safer now, *before* someone gets hurt?

Canopy Confidence Check Causes Consternation

Just in case you ever wondered, Maintenance Matters aren't fictional. They come from Air Force (and sister service) mishap reports of events that really did happen. They're written with the intention of helping you profit from the mis-

ce Matters

takes of others.

From time to time though, some downright strange mishaps do occur that make it difficult to draw a conclusion ("moral of the story") that might help you avoid injury or prevent equipment damage. Here's one of them. If you get an urge to giggle, it's okay. Just have a heart, and temper any chuckles with the knowledge that you could be the "victim" one day...

The Warthog was parked inside a hardened aircraft shelter (HAS), and an Electro/Environmental troop was troubleshooting a "Canopy Unlocked" light problem. He R&R'd a faulty downlock solenoid, but then couldn't get the canopy actuator to reengage. He requested an Aero Repair assist and, once done briefing the A/R troop on the new problem, departed the area.

The A/R troop climbed into the cockpit to try his luck and, after a little effort, got the actuator to engage. After confirming the unlock mark wasn't visible, he cycled the canopy and it appeared to open fine. But on the down cycle, it remained ajar about two inches from the full down and locked position. The canopy actuator had failed, locking the canopy in the (almost fully) closed position.

In accordance with tech data, the A/R troop pulled the canopy disengage lever on the right console to manually disengage it. The attempt was unsuccessful. He tried again. Unsuccessful again.

He then tried pulling the canopy actuator release lever behind the seat, but canopy position prevented handle movement. Foiled again! He considered jettisoning the canopy, but decided against it since he was inside a HAS.

He used his radio repeatedly to request help, but no one responded. (Out of sight, out of mind?) After waiting more than thirty minutes for someone (anyone!) to appear and render assistance, he started yelling through the two-inch crack for help ("Hey!!!!! Help!!!!!"). Nothing but echoes. Then he started screaming for help ("Seriously, now!!!!! Hey!!!!! Help!!!!!"). Nothing but more echoes.

Having exhausted all of his options, and upon reaching a maximum anxiety level ("Still stuck inside this *#@* A-10! *#@*! Still nobody around! *#@*!"), he used his remaining option—the canopy breaker tool—to free himself. Once outside the HAS, he was able to radio the Pro Super and explain what had happened and how he'd gashed his hand (three stitches worth) exiting the cockpit.

So, what's the golden nugget in this tale? Use the buddy system whenever possible? Ensure your radio always has fresh batteries? A-10 maintainers beware that even though this failure occurs only once in a blue moon it could happen to you? How about this: Following tech data and doing everything by the book is no guarantee you'll never find yourself in a jam. How you respond to a predicament that tech data doesn't cover might be the difference between an event you can laugh about later with your buddies, and one that requires convening a Safety Investigation Board. Be cool, be safe.

"CANN" Do! (Damage!)

A Pneudraulics team was dispatched to remove the inboard (IB) and outboard (OB) elevator actuators and manifolds from the left hand (LH) and right hand (RH) IB elevators on the C-5 CANN bird.

Since damping action normally provided by the actuators and manifolds would be absent once those parts were CANN'd, SOP dictated that gust locks be installed to prevent wind gusts from damaging the elevators and their attach points.

Hydraulic system "liquid lock" prevented the troops from positioning the elevators so that the gust locks could be installed. That the Calavar ("high reach") basket they were working from didn't provide a stable enough platform to muscle the elevators into the proper position didn't help either.

As fate would have it, not too long after the actuators and manifolds were CANN'd, the MACC issued a weather advisory for high winds. While in the vulnerability period, the CANN aircraft monitor heard loud banging noises coming from the tail of his aircraft. He looked up, observed the elevators bouncing violently from stop to stop with pieces of metal raining down and did the only thing he could do—take cover. In fact, wind gusts to 42 kts were recorded.

Once winds subsided enough to allow a proper examination, substantial elevator damage—to the tune of more than $16,000 and 500-plus repair manhours—was confirmed. Moral (stop me if you've heard this one before) of the story? Always follow tech data, command guidance and your local OIs. ✈

USAF Class A Mishaps

FY00 Flight Mishaps (Oct 99 - May 00)

9 Class A Mishaps
5 Fatalities
6 Aircraft Destroyed

FY99 Flight Mishaps (Oct 98 - May 99)

22 Class A Mishaps
7 Fatalities
16 Aircraft Destroyed

3 Oct	**♣**	**While conducting a SAR mission, a UH-1N went down.**
17 Nov	**♣**	**Two F-16Cs flying a night vision goggle upgrade sortie collided during a VID intercept. One pilot ejected and was recovered uninjured. The other pilot returned safely to base.**
22 Nov		**An OA-10A departed the departure end of the runway. The pilot ejected successfully.**
6 Dec	**✶**	**An RQ-4A Global Hawk UAV was extensively damaged while taxiing after landing.**
10 Dec		**A C-130E touched down short of the active runway, then diverted to another airfield and belly-landed. Three personnel were fatally injured.**
15 Dec		**An HH-60G rolled over at an LZ following a hard landing.**
20 Jan	**♣**	**An A-10 crashed during RTB. The pilot was fatally injured.**
16 Feb	**♣**	**An F-16CG on a routine training mission experienced an engine malfunction. The pilot ejected.**
16 Feb	**♣**	**An F-16DG flying a night vision goggle upgrade sortie crashed. Both crewmembers ejected**
28 Feb	**✶**	**A maintainer sustained fatal injuries after falling from the lower crew entry ladder on a C-5.**
19 Mar	**♣**	**An F-16C crashed while performing at an airshow. The pilot was fatally injured.**

- 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.
- "♣" 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, ground, and weapons safety statistics are updated daily and may be viewed at the following web address by ".gov" and ".mil" users: http://www-afsc.saia.af.mil/AFSC/RDBMS/Flight/stats/index.html
- Current as of 30 May 00.

☆ U.S. GOVERNMENT PRINTING OFFICE 2000-673-366/43074

Captain Pete Fesler

390th Fighter Squadron
Mt. Home AFB, ID

In May 1999, immediately after aerial refueling during an operational F-15C Offensive Counter Air mission in support of Operation Southern Watch, Captain Fesler's aircraft entered a sudden and uncommanded left roll. Captain Fesler countered the roll with flight control inputs and was able to safely gain separation from the tanker aircraft. During his return to base, his wingman confirmed that both rudders were deflected to the left and rudder pedal inputs did not fully alleviate this "hardover" condition. Captain Fesler was only able to maintain aircraft control by applying opposite aileron, using approximately 6" of stick deflection, and almost full opposite rudder.

Captain Fesler accomplished the checklist procedures for flight control malfunctions, which did not fix the problem. He found that the rudder trim switch would drive the rudders to neutral, but they deflected to the left again as soon as he released the switch. Countering significant and fatiguing flight control forces, he accomplished several controllability checks to determine the safest configuration for approach and landing. He dumped fuel to lower his gross weight and flew a straight-in approach. During the approach, he made only right-hand turns to avoid deflecting the rudders further to the left.

Captain Fesler executed a flawless approach-end arrestment. After engaging the cable, the aircraft yawed violently to the left. He applied right rudder and braking to keep the aircraft from departing the runway surface. The aircraft came to a stop 20 feet from the left side of the runway. Captain Fesler demonstrated superb airmanship and skill in handling an unusual emergency situation and saved a valuable Air Force aircraft. ✈

TAKE FIVE... for safety

Five minutes reading this could save your life!

178 SECONDS

If you're ever tempted to take off in marginal weather and have no instrument training, read this article first before you go. If you decide to go anyway and lose visual contact, start counting down from 178 seconds.

How long can a pilot who has no instrument training expect to live after he flies into bad weather and loses visual contact? Researchers at the University of Illinois found the answer to this question. Twenty student "guinea pigs" flew into simulated instrument weather, and all went into graveyard spirals or roller-coasters. The outcome differed in only one respect: the time required till control was lost. The interval ranged from 480 seconds to 20 seconds. The average time was 178 seconds—two seconds short of three minutes:

Here's the fatal scenario...

The sky is overcast and the visibility poor. That reported 5-mile visibility looks more like two, and you can't judge the height of the overcast. Your altimeter says you're at 1500 but your map tells you there's local terrain as high as 1200 feet. There might even be a tower nearby because you're not sure just how far off course you are. But you've flown into worse weather than this, so you press on.

You find yourself unconsciously easing back just a bit on the controls to clear those none-too-imaginary towers. With no warning you're in the soup. You peer so hard into the milky white mist that your eyes hurt. You fight the feeling in your stomach. You swallow, only to find your mouth dry. Now you realize you should have waited for better weather. The appointment was important—but not that important. Somewhere a voice is saying "You've had it—it's all over!"

You now have 178 seconds to live. Your aircraft feels on an even keel but your compass turns slowly. You push a little rudder and add a little pressure on the controls to stop the turn but this feels unnatural and you return the controls to their original position. This feels better but your compass is now turning a little faster and your airspeed is increasing slightly. You scan your instrument panel for help but what you see looks somewhat unfamiliar. You're sure this is just a bad spot. You'll break out in a few minutes. (But you don't have several minutes left...)

You now have 100 seconds to live. You glance at your altimeter and are shocked to see it unwinding. You're already down to 1200 feet. Instinctively, you pull back on the controls but the altimeter still unwinds. The engine is into the red—and the airspeed, nearly so.

You have 45 seconds to live. Now you're sweating and shaking. There must be something wrong with controls; pulling back only moves that airspeed indicator further into the red. You can hear the wind tearing at the aircraft.

You have 10 seconds to live. Suddenly, you see the ground. The trees rush up at you. You can see the horizon if you turn your head far enough but it's at an unusual angle—you're almost inverted. You open your mouth to scream but...you have no seconds left.

Transport Canada Aviation | Transports Canada Aviation | Canada

(Editors' Note: This item, while aimed at those without instrument training, points out how fast you can get in trouble. Aero club flyers, take heed.)