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Landings are Not an Option

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SAFETY SAGE

IS THERE A "*NEXT TIME*" IN YOUR FUTURE?

Courtesy ASRS *Callback* #269
NASA's Aviation Safety Reporting System

ASRS reporters often use the phrases "next time" and "in the future" to introduce the safety lessons they have learned from incidents. In fact, the ASRS database contains more than 6000 narratives that use these exact words. As we ring in the aviation New Year, a sampling of resolutions from the ASRS reporting community provides food for thought.

"Next time I will ask about any hold short sign" (Air Carrier Captain)

• From de-ice pad to Runway 28, told by Ground to taxi to Runway 28 on Taxiway J, stay on Ground frequency. On Taxiway J, taxied past a sign labeled "Runway 28 Cat I Hold." After passing sign, Ground said we were 1000 feet past the runway hold short [spot] and to contact Tower… Since Runway 28 was being used for departing [aircraft] only, we taxied past the spot. Lesson learned.

"Next time we will review the Terminal Area Chart before takeoff" (GA Pilot)

• We had been searching all day for a missing aircraft. Upon leaving our mission base for our home base, we tried to contact Approach for clearance through the Class B airspace. He [the controller] was extremely busy and said to stay clear of Class B airspace and remain VFR. We had been climbing at that point, expecting clearance. We immediately descended to 1200 feet to stay clear (below) the Class B airspace, and used the DME to stay approximately eight miles away. The controller called back a few minutes later for our request, and at that time, he said we were in Class B airspace under the approach path to [major airport's] runway 19R… Next time we will review the Terminal Area Chart more before takeoff.

"In the future, I will keep this aircraft on the ground" (Air Carrier Maintenance Technician)

• Aircraft arrived at gate with [log note]: 'rudder travel unrestricted' light illuminated during flight at altitude and system operated normally on approach. I visually inspected the rudder limited system and couldn't find any abnormalities, but should have further investigated and hooked up a pitot source and checked the system as it would be inflight at altitude. However, we don't have the equipment at this station, and it would have to be shipped here to check the aircraft by the procedure. In the future, I will keep the aircraft on the ground rather than releasing it due to a turnaround condition and open the gate to the next inbound flight.

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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Commercial Prefix (505) 846-XXXX

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

24-hour fax: DSN 246-0931

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Missed Approach Primer

LT COL PAT KOSTRZEWA
Advanced Instrument School
Randolph AFB TX

NTSB Identification: DEN01FA030

"While in the landing flare, the captain reported that strong cross-winds and blowing snow created a 'white-out' weather condition. The airplane touched down 195 feet left of the runway centerline in snow covered terrain between the runway and taxiway...

"Probable Cause: The pilot's failure to follow IFR approach procedures and perform a missed approach when the runway was not in sight below approach minimums."

NTSB Identification: IAD05MA006

"At 1226:53, the flight crew advised that they were 'established inbound' on the approach.… During the final segment, the airplane showed a gradual descent and leveled at 2600 feet, in the vicinity of the missed approach point. About 1 mile past the missed approach point, over the runway, the airplane began a descent, and continued on an approximate heading of 305 degrees.

"The published missed approach procedure was, 'Climbing right turn to 2600 [feet] BALES LOM and hold.'

"The airplane continued on the 305 heading and continued the descent beyond the airport. At 1230: 16, at 1,800 feet and 3 miles beyond the airport, the altitude readout went into 'coast' and the altitude readout was lost.

"At 1233:08, the flight crew called the controller. The controller responded and the flight crew stated, 'We're going missed at this time.' The controller asked the crew to repeat the radio call. The call was acknowledged, and at 1233:21, the controller advised the crew to 'climb and maintain four thousand four hundred' feet. There were no further radio transmissions from the accident crew."

NTSB Identification: SEA00LA040

"The pilot stated that he had been cleared for and had flown the VOR runway 30 approach. Upon his arrival at the missed approach point, he did not have the runway or the airport environment in sight… he continued to the west side of the airport and made a left turn, for a downwind saying he intended to use the localizer frequency to help him find the runway… He offered no explanation as to how the aircraft wound up about eight miles north of the airport on the mountainside...

"Probable Cause: Failure of the pilot-in-command to follow the prescribed instrument approach missed approach procedure."

USAF Photos
Photo Illustration by Dan Harman

Most of us would agree that the idea of a missed approach is a relatively simple thing. It's just a procedure to get me away from the ground and up into the radar pattern when I can't land the aircraft at the end of an approach. We teach our young pilots at SUPT to recite the three reasons we go missed approach almost as if it were a boldface. We're supposed to review the missed approach when we review the approach plate and coordinate alternate missed approach, if required. The term "missed approach" is written 171 times in AFMAN 11-217, *Instrument Flight Procedures*! Yet, with all this preparation and training, most of us are only going to actually go missed approach in the weather a handful of times in our careers. Like a lot of things we do, no one will notice much if we do it right; that's what we're paid to do. But if your chance to shine comes on a day when you're not prepared and things go wrong, chances are a lot of people will notice.

Since most mishaps that occur during the missed approach can be traced to failure to execute the basic procedures (see all mishaps listed above), let's review the basics of the missed approach.

1. What is the missed approach procedure?
2. How do I determine the missed approach point?
3. When do I go missed approach?

What is the missed approach procedure?

AFMAN 11-217 says: *"The missed approach departure instruction is designed to return the aircraft to an altitude providing en route obstruction clearance."*

FAR/AIM goes on to say: *"Protected obstacle clearance areas for missed approach are predicated on the assumption that the missed approach is initiated at the decision height (DH) or at the missed approach point and not lower than minimum descent altitude (MDA). A climb of at least 200 feet per nautical mile is required…unless a higher climb gradient is published on the* approach *chart."*

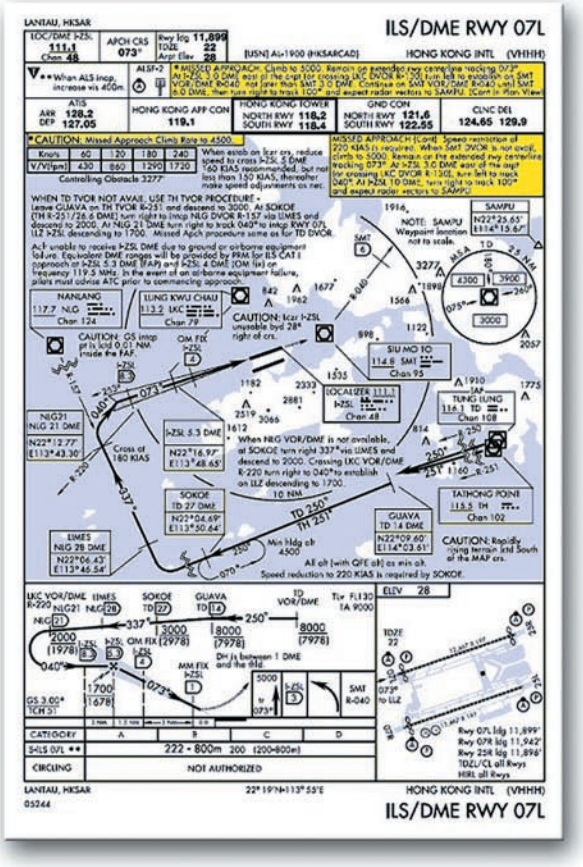
Remember, that unless otherwise published, you are supposed to climb out at least 200 feet/NM, which roughly equates to a two-degree climb. Also, make sure that during your approach review you check for a non-standard missed approach climb gradient—it's not always easy to spot.

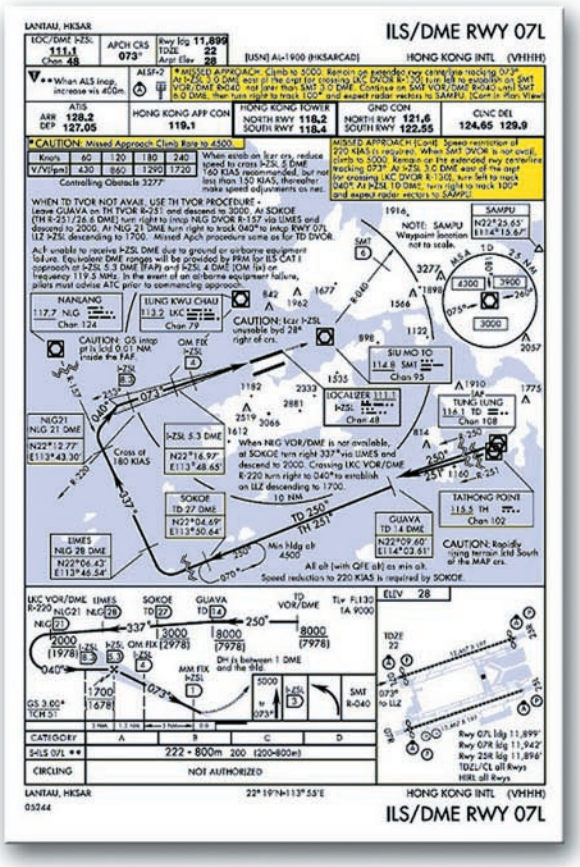
FAA Order 8260.3B *U.S. Standard for Terminal Instrument Procedures (TERPs)* is the guidance which TERPs specialists use to build instrument procedures. In regard to the missed approach it says:

"The missed approach procedure must be simple, specify an altitude, and a clearance limit.

"Whenever practical, the missed approach course should be a continuation of the final approach course. Turns are permitted, but should be minimized in the interest of safety and simplicity."

As I said before, this is all a relatively simple thing…right? Let's look at an approach plate.





"Simple" here is in the eye of the pilot flying the missed approach. Obviously, there are many things happening in this airspace that turned our "simple" missed approach into the chocolate mess shown. The TERPs specialist cannot always give us "runway heading to 2000 feet"—that's why we need to review the missed approach procedure before the time comes to fly it. (Note the climb gradient listed in the upper left corner of the plan view and the 3277-foot peak directly on runway heading just outside the 10 NM circle.)

Determining The Missed Approach Point (MAP)

Determining the missed approach point is a fairly straightforward procedure, and yet we've all found ourselves in situations where it takes some serious thinking to figure out where the missed approach point went. Hopefully, this moment of clarity or non-clarity doesn't occur when you're at the final approach fix.

AFMAN 11-217 describes the precision MAP as:

"The missed approach point for any precision approach is the point at which the decision height is reached."

Remember here that the TERPs construction of a precision approach does allow for a momentary deviation below decision height in conjunction with a proper missed approach initiated at decision height.

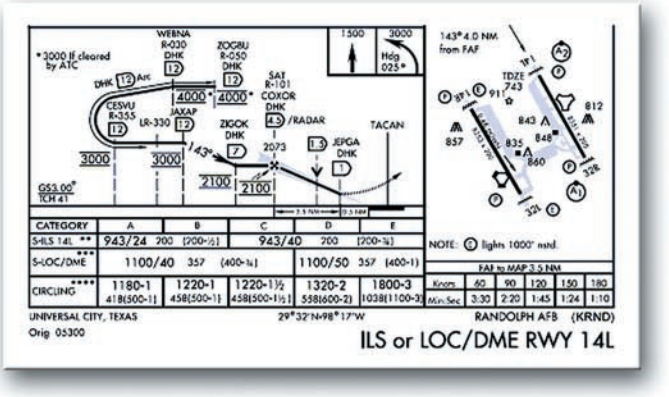
How about a non-precision MAP? AFMAN 11-217 says:

"The missed approach point for a non-precision straight-in approach is located along the final approach course and no farther from the FAF than the runway threshold (or over an on-airport navigation facility for a no-FAF procedure and some selected FAF procedures). To determine the location of the MAP, compare the distance from the FAF to the MAP adjacent to the timing block. It may not be the same point as depicted in the profile view. If there is not a timing block, the MAP should be clearly portrayed on the IAP."

It also cautions:

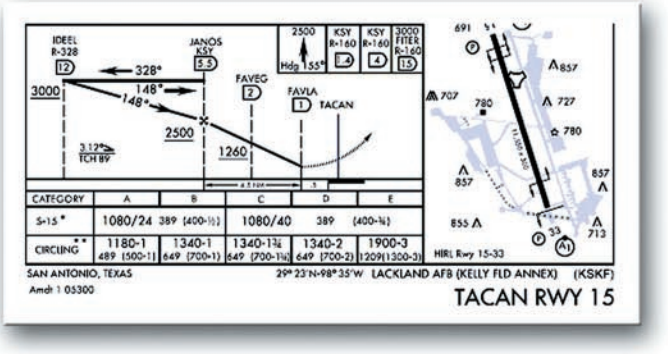
"The MAP depicted on the IAP is for the non-radar approach with the lowest HAT. For example, on an ILS approach designed by the FAA, the MAP printed will be for the ILS DH. The MAP for the localizer will probably be at the approach end of the runway and the only way to determine this is by the distance listed on the timing block."

There is much more verbiage for the non-precision missed approach point because of the variety of non-precision approaches out there. Let's look at a few.



For the LOC/DME RWY 14, I look at the distance from the FAF to MAP above the timing block and see that the distance is 3.5 NM. Then by looking at the profile view I see the FAF (depicted by the Maltese cross) is at DHK 4.5 DME and that 3.5 NM from there is DHK 1.0 DME. What could be easier?

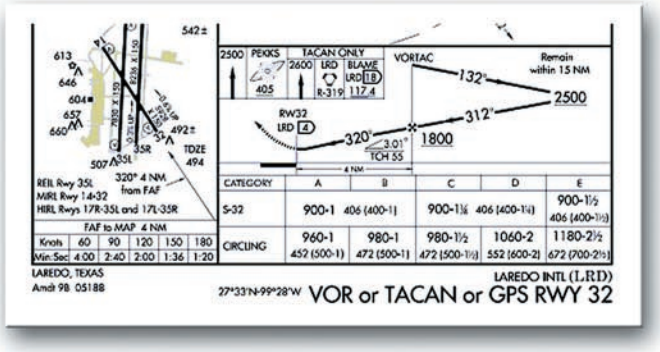
How about this one?



Hmmm…no timing block with information above it to tell me how far from the FAF to the MAP. Remember, "If there is not a timing block, the MAP should be clearly portrayed on the IAP." So

I look over at the profile view and can see that the dotted line begins at FAVLA (look in the front of the approach book and it tells you the dotted line is the missed approach track in the profile and plan view), so that is our missed approach point. This brings up a good question, though: How come there is no timing block on a TACAN approach? The reason is FAA Order 8260.3B does not give the TERPs specialist the option to depict a TACAN MAP with timing—it must be a radial/DME fix. This is because if you lose DME on a TACAN approach, you should also lose course guidance. If you don't lose course guidance, you've either got an aircraft equipment malfunction or a TACAN malfunction; either way, you should abandon the approach. Timing with no course guidance doesn't make for much of an approach in the weather. (By the way, you'll notice the same thing, for the same reason—no timing block—on any stand-alone GPS approach.)

Now, let's ramp up the difficulty.



If I wanted to fly the VOR approach, what would I use to identify the MAP? Notice I didn't ask for the MAP for the VOR/DME, since there is no VOR/DME option. For a VOR approach, the MAP would normally be determined by timing for the appropriate airspeed. In this case though, AFMAN 11-217 has some additional guidance if you have the right equipment. AFMAN 11-217, para. 14.2.1.2.2.3. says: *"If other means of identifying the MAP are published (e.g., DME), they should be used as the primary means to determine the MAP. In these situations, timing is a good backup, but it is not the primary means of identifying the MAP."* If you were also TACAN-equipped, you would be expected to fly the VOR course and use the TACAN DME fix (LRD 4 DME) as the primary method of determining the MAP and use timing as the secondary method.

Since we've already seen it above, let's talk about timing. AFMAN 11-217 says:

"If timing is not specifically depicted on the instrument approach procedure, timing is not authorized as a means of identifying the MAP.

"Timing is the least precise method of identifying the missed approach point; therefore, when the use of timing is not authorized for a particular approach because of TERPs considerations, timing information will not be published."

I think you get the point. If there's no timing block, you don't make up your own to determine the missed approach point.

When To Go Missed Approach?

As I mentioned in the introduction, we treat the three reasons for going missed approach almost like BOLDFACE at our SUPT bases. Also, I know that anyone who already has pilot wings on their chest knows these rules by heart, but we'll review them just in case it's been a while since you looked in 11-217.

AFMAN 11-217 says:

"Perform the missed approach when the missed approach point, decision height (DH), or decision altitude (DA) is reached and any of the 3 following conditions exists:

(1) The runway environment is not in sight.

(2) You are unable to make a safe landing.

(3) You are directed by the controlling agency."

The most common reason for missed approach is not having the "runway environment" in sight at the MAP. Just what is the "runway environment?"

AFMAN 11-217 says:

"The runway environment consists of one or more of the following elements:

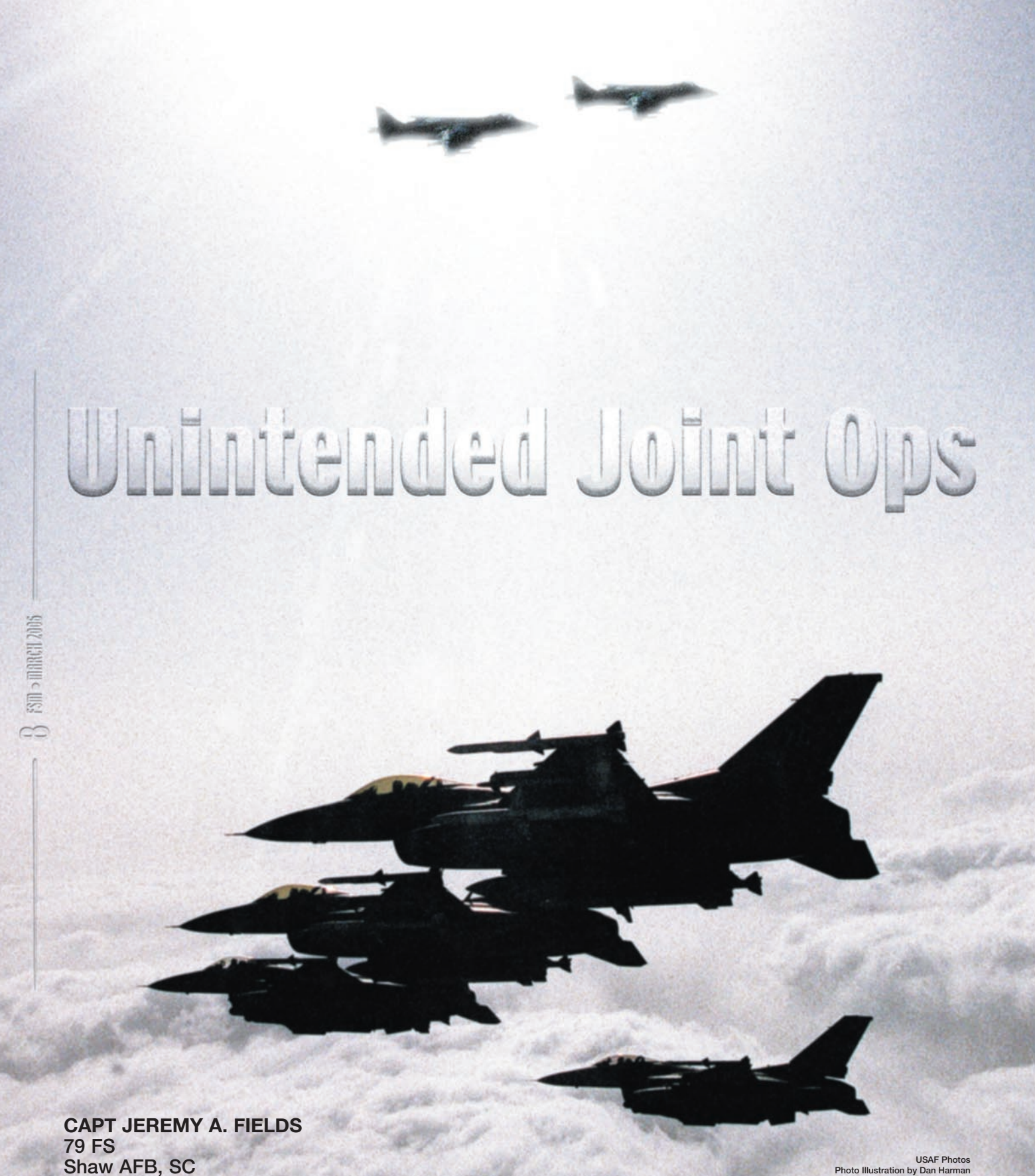
- *The approach light system (except that the pilot may not descend below 100 feet above the TDZE using the approach lights as a reference unless the red termination bars or the red side row bars are also visible and identifiable).*
- *The threshold, threshold markings or threshold lights.*
- *The runway end identifier lights.*
- *The touchdown zone, touchdown zone markings, or touchdown zone lights.*
- *The runway or runway markings.*
- *The runway lights.*
- *The visual approach slope indicator."*

Mishap No. 1 above (NTSB Identification: DEN01FA030) is a good example of both not having the runway in sight simultaneously with not being in a safe position to land. Blowing snow and fog banks can easily put an aircraft in that position.

Conclusion

I've only reviewed some of the guidance that AFMAN 11-217 has regarding missed approach. Remember I said that the term is mentioned 171 times in 11-217? Obviously, I've only tried to cover the big picture items here. Answering Instrument Refresher Course questions about missed approach and writing articles about missed approach do not ensure you or I will execute our next missed approach attempt successfully. Knowing what AFMAN 11-217 says in addition to adequately reviewing the missed approach procedure and practicing the procedure in both simulators and aircraft are the best insurance we have against "getting noticed."

Unintended Joint Ops



CAPT JEREMY A. FIELDS
79 FS
Shaw AFB, SC

USAF Photos
Photo Illustration by Dan Harman

There I was, at 500 feet AGL flying a 2v2 LOWAT (low altitude air-to-air) sortie as part of my F-16 B-course. As I completed my intercept with a low-to-high conversion to the merge, I called out my tally, "Viper 2, tally 2!" After making this expected radio call, I quickly followed with "Tally 3…Tally 4! Vipers, knock it off!" There were four aircraft within 30 degrees of my nose, all within two miles

of each other. Approximately 1000 feet above the other F-16 element was a flight of two Marine Harriers, flying in the opposite direction, unbriefed and unscheduled in our Military Operations Area (MOA), and oblivious to our existence. The Harriers seemed to be holding, and never attempted any tactical maneuvering. We spent the remainder of our airspace time following the Harriers at a safe distance, while attempting to contact them visually and by using the MOA frequency and guard, all to no avail.

After returning to base, my flight lead was eventually able to talk to the Marines and discovered they were waiting to enter the adjacent MOA. They entered our MOA to hold because they didn't think anyone was using it. They weren't on our MOA frequency because they were listening to the neighboring MOA's frequency to find out when it emptied for their use. Thanks primarily to the "Big Sky Theory," this incident only resulted in incomplete rides for two B-course students. It easily could have resulted in a midair between two or more aircraft at low altitude.

It's unfortunate that this is not a lone incident. Countless times, ATC has given me traffic advisories of VFR aircraft or restricted my altitude because of IFR aircraft transiting our MOA. Worse, I've witnessed unbriefed military and civilian traffic flying through the middle of my MOA without any calls from ATC. I'm not alone; many pilots have had similar experiences.

Most of us know that while a flight might "own" a MOA for a certain amount of time, this ownership doesn't mean other aircraft are prohibited from entering the airspace. General Planning (GP) defines an MOA as "airspace established outside of Class A airspace to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted." AP/1A further clarifies this by stating, "The FAA established MOAs in which certain military flight training may be conducted on a scheduled basis. MOAs are charted so nonparticipating aircraft may be aware of these operations. Special conditions of use and procedures for each MOA are established by a letter of agreement between the local military authority and concerned ATC facility." In other words, don't be surprised if IFR or VFR traffic enters your active MOA. Furthermore, don't be surprised if VFR civilians near your base have never heard of a MOA. How do we mitigate these risks while still getting effective MOA training? There are several answers.

The first answer is knowledge. Before you even step to fly, know your local area. Be familiar with your local letter of agreement to know what to expect from ATC and what ATC expects from you when flying in the MOAs. Know the local flying environment. Do the local civilian airports or flying clubs have established VFR flying corridors or areas they typically work? Are there other military bases around you that also share the use of your MOA? By exception, units with flying programs are required to have a Midair Collision Avoidance (MACA) program to not only answer these questions, but also to share the same information with local airports so the average civilian weekend pilot is aware of the general military operations and procedures in the local area. Seek out and learn from your local MACA program.

The second solution also occurs before we step to fly: mission planning. You'd think we would know the rules and regulations regarding MOAs. After all, they're there for our use. However, as often as not, we are the worst offenders. When planning a mission, know the boundaries, both the borders and the scheduled time, of your airspace, and stay within them once you're airborne. For a cross-country flight, look at your charts and take note of which MOAs you'll be flying near. If going direct from Base X to Base Y takes you through 10 active MOAs, then maybe going direct isn't the best answer. If VFR, stay clear of them. Do you really want to fly through the middle of Vance's MOA and expect a solo T-37 student to watch out for you? If IFR, stay on the jet routes or be aware that ATC will either steer you around active MOAs or give an altitude cap to your fellow aviators inside the MOA to stay away from you. Either way, plan smartly to minimize the risks.

The last solution I'll offer is in our own cockpits while we're airborne. Keep your cranium on a swivel and look out for that traffic. Use your radios and whatever avionics are available to listen and search for other aircraft. Use your radar to help you scan for transients through your airspace. Use your IFF interrogator and scan not only for military traffic, but also for that guy squawking 1200 as he flies VFR for a weekend getaway. Don't get complacent just because you're "safe" in a MOA. As my weapons officer once said, "Always expect there to be more aircraft at the merge than you have situational awareness on."

Realize that the story and lessons learned presented here only address MOAs. Apply these same principles to other special-use airspace. Plenty of pilots, military and civilian, have inadvertently flown through restricted areas, for example. Also apply these same principles to military training routes. I could easily have presented a different "There I Was" story based on a VR, SR, or IR route. There's probably an even greater likelihood of encountering unbriefed and unscheduled aircraft on a Military Training Range than in an MOA.

The bottom line is to be proactive. There are many things we can do as aircrew to mitigate the midair collision risk, and not rely quite so heavily on the "Big Sky Theory."

No Harm, No Foul

ANONYMOUS

As aviators, one of the first rules that we learn in pilot training is, "If an approach doesn't look right, go around." No matter what airplane we fly, this maxim serves us well. There is absolutely no harm in terminating an unsafe approach, to try it again. Sometimes, however, we find it difficult to follow this advice. Whether it is to move the mission, get back home, or simply put an end to a long day, we all want to try and land the aircraft safely on the first try. Regardless, there are times when it is worth the few extra minutes to go around and make a second try.

I was flying a mission in the C-141 Starlifter. It was a channel mission, passing through Europe, into Southwest Asia, and back again. We were approaching the end of a 24-hour duty day, en route to Sigonella NAS, Italy. It was the middle of the night, and there were scattered cloud decks at various altitudes, although the field itself was clear. As we began the descent, we checked ATIS. The ATIS called for unremarkable weather, with the TACAN approach to Runway 28 in use.

As a wag, a common descent technique in the C-141 was to start down at a distance approximately three times your altitude. That is, if you were flying at 30,000 feet, you would start down at about 90 miles from the field. Of course this could be adjusted for winds, direction of the runway, and the like. In this case, winds were negligible, and we were approaching Sigonella from the west, so I believed I had plenty of time to descend. After all, we would have to fly all the way to the other side of the field to land to the west. I began a standard descent profile at about 100 miles from the field.

During the descent, we were held up a couple of times by ATC, but things were otherwise proceeding nicely. I figured I'd have plenty of time to make the descent without any problems. The descent and approach checklists were out of the way, and we were approaching about 12,000 feet, when approach control called and asked if we could accept the TACAN approach to Runway 10. I thought to myself that it might be a little tougher to make that descent, but it certainly was not impossible. Besides, everyone on the crew was tired, and this would save us some time and allow us to enter crew rest sooner, since we were already lined up with the runway.

I knew that I usually gave myself an extra 10 miles of descent room if we were directly aligned with a runway, as we were now, but I figured I could still make it. I pulled the throttles to idle, deployed the speed brakes, and established a greater rate of descent. Then I retracted the speed brakes and configured the aircraft with gear and flaps in order to expedite the descent further. Up to this time, I could not see the field more than sporadically, as we were moving in and out of cloud layers.

I could not see the field more than sporadically, as we were moving in and out of cloud layers.

USAF Photo
Photo Illustration by Dan Harman

When we finally passed through the final cloud layer at about 2500 feet, it was obvious that I was not going to land on this attempt. I saw four white lights on the PAPI, and I was far too high to have any chance of landing safely. At this point, I called a go-around, and executed a missed approach. The tower cleared us to remain in the visual pattern. I entered the visual pattern, landed uneventfully, and taxied to parking.

That experience taught me two very important lessons. First, do not let yourself be rushed unnecessarily. The entire crew was prepared for the TACAN Runway 28. I had briefed it, the crewmembers were all looking at that approach plate, and it was what everyone was prepared for. When I accepted the TACAN Runway 10, everything was out the window. I had to give the other pilot control of the aircraft while I flipped through the approach plate, found the new approach, studied it, and briefed it. Meanwhile, I had set myself up for a difficult time on that descent. Of course, it is important for aircrews to remain flexible and able to react quickly. However, it may have been more prudent for me to tell the controller that I was unable to make that profile, and that we would prefer to continue on the planned approach to 28.

The second important lesson for me was the importance of the go-around. I sent myself around, and I was somewhat annoyed with myself. I was annoyed that I had allowed myself to fall behind in the descent profile. I was annoyed that I had not been able to salvage the landing. However, in the end, I am happy that I recognized the situation for what it was and did not allow myself to develop a rapid sink rate close to the ground in an attempt to pick up the glideslope, forcing a member of my crew to send me around. Further, I am glad that the situation did not develop from one that was merely a little behind the power curve, into a situation that was truly dangerous.

In the end, it was no harm, no foul. Although I might have been a little embarrassed and annoyed at my performance, nobody on the crew had any heartache with the go-around. As we debriefed the sortie on the crew bus, we talked about ways that we could have avoided the situation in the first place, such as not accepting Runway 10. However, once we reached the point of realization that it was unsafe to continue the approach, everyone agreed that the go-around was the correct decision.

As aviators, we all need to remember the utility of the go-around. Although we may sometimes be highly motivated to get the aircraft on the ground on the first attempt, it is certainly not worth risking the lives of our crewmembers to try and salvage a potentially hazardous situation. The extra time spent to execute a second approach, and land safely, is well worth it. ✈

CRM and the Missed Approach

MAJ LEE OWENS
412 OG/OGV
Edwards AFB CA

USAF Photo by SSgt Matthew Hannen

We all know mistakes happen on every flight. It is the consequence of these mistakes that will determine if you have a post-mission debrief or a mishap investigation board. Before CRM was a formal class, complete with its own AFIs, I was able to fill my experience bag with some CRM lessons learned years ago.

I was on my first deployment to Prince Sultan Air Base (PSAB) in support of OPERATION SOUTHERN WATCH (OSW). The copilot and I were recently-winged lieutenants fresh out of UPT/UNT who also went through AWACS initial qualification together. To minimize the inherent risk of two new guys in the cockpit, the Aircraft Commander (AC) and Flight Engineer (FE) were experienced E-3 flyers who had been to the AOR before. Our AC was scheduled to upgrade to instructor pilot after the deployment, and the FE was an instructor. During this time period, the AWACS community was toying with the idea of hard crews, so the AC and FE had flown together before and the Co and I were add-ons. Also, the AC was probably going to be our supervisor. Needless to say, there was some halo effect developing, and I had a self-imposed desire to shine (which, conversely, means a fear of screwing up).

Most aviators have "Type-A" personalities. The key in a crew aircraft is getting those personalities to mesh into one effective team. Too much aggressiveness leads to one-sided opinions and closes the communication flow. In the beginning, the copilot and I noticed the AC would virtually ignore any inputs we gave and then dictate how things were going to be. If we made mistakes or were unsure of answers, we'd get "timely feedback." Since the AC was a former bomber driver who always preached about how things ran back in SAC, we just figured this was old school "grooming." But after a few weeks of being browbeaten, we realized it was easier to be silent and get through the sortie. Worse, if the AC made a mistake, we wouldn't call him on it but would silently do the correct action. This atmosphere set the stage for individual "seat commanders" instead of one effective flight crew.

On the incident day, weather (WX) was forecast to be marginal at best. Strong crosswinds and sandstorms were forecast all day at the field. The MOA was forecast to have solid decks and limited vis. But no self-respecting Coalition Forces Air Component Commander is going to cancel on a forecast. Send the mighty E-3 (and its tanker) up the corridor to give a PIREP before the main group has even taxied. Well, lo and behold, the weather prophets were spot-on. No sooner had we fought our way up the corridor than OSW got cancelled for the day and all airborne assets were WX recalled.

The tanker got back first, so we went into holding while the tanker tried to shoot the approach. Crosswinds were already at the E-3 limits when the tanker reported zero vis due to blowing sand. We listened to the tanker go missed approach and return to holding (a few thousand feet below us).

At this point, the FE said we had enough fuel to hold for 2.5 hours before needing to divert. We made a quick call to our unit SOF to update him on our status. At this point, the AC decided to give it the college try.

Approach called winds at the field above our max crosswind limit. The ceiling and vis were reported as rapidly deteriorating due to sandstorms. At this point the copilot asked why we were commencing an approach when WX was below our mins. The AC said the WX guessers always gave doom and gloom forecasts. Ignore the fact that we were listening to observations, not forecasts. So we began the approach check.

At this point the AC directed the Co to call approach control and let them know what crosswind component we needed to land. Approach acknowledged and advised that winds were currently above that limit. At this point the FE said something to the effect of, "This is stupid; let's go hold." (Substitute stupid with standard gruff engineer-speak and you'll get the true statement.) The AC stated he would continue and ask for wind check prior to the Missed Approach Point (MAP).

Final approach fix, gear down and winds still out of limits. But at least the reported ceiling had raised to mins. AC called for the Before Landing checklist, and FE again voiced his concern that we were taking an unnecessary risk. The AC said he was continuing. Copilot then stated that we should knock it off. AC didn't respond. After calculating the minimum ground speed, I noticed we were precariously below it. (The E-3 doesn't have a windshear alert system, so the nav calculates a min groundspeed and if the pilot has to fly an airspeed that is greater than Vref plus 20, then the approach should be discontinued).

Approaching decision height (DH), the copilot stated he didn't have any cues. Normally, the AC should respond with "cues" and state what he sees or confirm that he also doesn't have any visual cues. I called 10 knots below min ground, crosswind 22 knots. The FE had enough and called, "Go around," approximately 100 feet above DH. However, the AC didn't acknowledge the call. The copilot repeated the go-around call. Again no acknowledgement. Tower called winds at our limit. At DH, the copilot again called, "Go around." The pilot didn't acknowledge and continued. The only thing visible out the window was complete brownout from sand. At this point, all three of us simultaneously called, "Go around," in an excited tone. Wham! We were on the ground.

We didn't see the runway until we actually landed, and then we saw that we were approximately 20 feet left of centerline. Almost on cue, tower called the winds magically back above our limits. The After Landing checklist was executed uneventfully but with a thick air of tension. After the post-mission debrief (with the entire crew), we (the flight crew) stayed back and had a sit-down with the DO.

The AC stated that at DH he thought he had the threshold in sight. But he admitted to losing sight prior to touchdown. However, he said he knew that he was lined up before he lost sight and didn't think he drifted off centerline too much. The clincher was that he stated he would've done it the same way if put in the situation again. The AC said he heard the go-around call but didn't honor it because he knew he could "bring it home." He responded that if the copilot felt so strongly about going around, he should've taken the plane. Now, you can argue about whether the copilot should've taken the plane, but you can also argue the AC should've honored the go-around call. However, since we made it back to terra firma in one piece, our story became a topic for hangar flying instead of a case study for the HQ Air Force Safety Center.

Anytime a crewmember/wingman reacts in an unexpected manner, keep asking the question, "Why?" As I said, we had plenty of fuel to hold. So the DO kept asking the AC why he felt the need to bring it home right away and discovered our crew was not confident on divert procedures. Sure, we had divert cards/inflight guides and could rattle off divert bases' distance/fuel. However, none of us really knew what to do after the divert. Our feeling was that PSAB was "our" base and Base X was "their" base. We were a Priority B asset with a whole lot of classified info on the jet and were unarmed. Nobody wanted to deal with those "headaches."

The lesson learned: It's easy to plan for mission success, so plan the "what ifs" all the way though. We discussed divert approaches but never discussed post-landing. The more familiar you are with alternatives, the more confident you are in mission execution.

Another lesson learned was that CRM starts on the ground. The AC never realized that his leadership style had shut us down. Conversely, I never gave feedback. CRM isn't lovey-dovey group hug, but if something is bothering you, put it out there in public. You'll be surprised how many other things will come to surface.

The final lesson learned was to respect inputs, regardless of who they come from. Now that I'm a "been there, done that" field-grader, I have to catch myself from saying, "That's the way it is." New guys' clue bags are filled with just book knowledge. But sometimes they'll surprise you with the book answer because the last time you religiously studied 11-217 was back when it was 51-37.

I internalized that "what if" rule. During mission planning I might ask, "What if this happens…" This way we have discussed our options and already know how each person is going to react.

Those Silly Training Rules

ANONYMOUS

As a "youngster" I began my Air Force career in an era where we fully expected the next war to be fought at low altitude. The standard minimum altitude was 250 feet AGL, and many of us were checked out to fly on TFR at 200 feet (all weather day/night) and hand-fly at 100 feet AGL (day VMC).

The aircraft I began my career in was the venerable F-111. An excellent deep-strike aircraft, the 'Vark was found wanting in the air-to-air arena. As such, we had many training restrictions on what we could and couldn't do with respect to aerial combat.

As a young lieutenant just out of Lead-in Fighter Training (LIFT) I, and other young pilots, often found ourselves chafing at the bit to demonstrate the aerial skills we'd perfected in our eight BFM hops at LIFT. Unfortunately, there were those silly training rules…one of which stated, "Thou shalt not fly BFM." The closest thing to air-to-air we could legally perform was a "defensive threat reaction." This involved allowing our aircraft to be an "embellished target" for the air-to-air jocks. We could threat react once we'd acquired a tally but could not offensively engage the attackers. We were also required to terminate all maneuvering after the initial reaction.

To a young fighter jock, these training rules were suffocating restrictions put in place because the "old guys" couldn't hack air-to-air anymore. That wasn't good enough for me…and the opportunity to prove the old guys wrong presented itself one spring morning. I was scheduled as No. 2 of a two-ship interdiction mission taking off out of RAF Lakenheath, England. Our brothers from the RAF had called and asked if they could run a couple of intercepts on us as we made our target runs in Scotland. My flight lead agreed and briefed us appropriately.

Our flight was proceeding normally and my WSO and I were in tactical formation to the east of our flight lead, running about 250 feet AGL and 540 KIAS. As we approached the Initial Point (IP) from the south, our Radar Warning Receiver (RWR) lit up. About that time, we picked up a tally on two RAF interceptors approaching from the west. I called the break turn, and both lead and I pulled our jets into the threat.

At that point, I should've discontinued maneuvering my jet IAW the regs (but then, I wouldn't be telling this story). But as I watched the fight develop, I noticed both interceptors pursuing

my flight lead. I quickly selected afterburner and extended for energy, just like I'd learned at LIFT. I pitched back into the fight using a climbing right-hand turn to decrease my turn radius and preserve energy. However, the energy decay from the climb, coupled with the aft wing sweep, made my turn radius slightly larger than the city of Chicago.

Arcing around the other three aircraft, I saw the interceptors maneuvering away from lead. My WSO noted that our flight lead was still rocking his wings (which is what we should've been doing). Please note the word "still" in the previous sentence. As a good WSO, he was intently watching the events out the right side of the jet (remember the 'Vark has side-by-side seating). Of course, I was looking out the right as well; that's where the action was.

USAF Photo by MSgt Kevin J. Gruenwald

The hair on the back of my neck began to stand up, and I remember thinking to myself, "If he's looking out the side of the jet…and I'm looking out the side of the jet…who's looking out the front?" I will never forget the feeling of stark terror that rushed over me when I snapped my cranium back "eyes forward" and saw nothing but green grass in the windscreen. My right hand snatched the stick into my lap, and my left hand slammed the wing-sweep handle full forward.

Since I'm telling this story, we obviously cleared the hill. Our analog radar altimeter had a dial readout in increments of ten feet. It's mounted just under the glare shield and is in the pilot's peripheral field of view while looking out the windscreen. The altimeter arrow was almost touching the zero as our jet clawed back into the blue sky. My WSO grunted under the G onset and asked what I was doing. I told him I was terminating our maneuvering. He never knew how close we were to packing it in, and I wasn't going to tell him how close I came to widowing his wife.

I learned several very valuable lessons that day. Training rules are established for a reason, flight discipline is not just a phrase in the motherhood briefing, and maybe those "old guys" actually know what they are talking about. The Blue Four News is rife with examples of aviators disregarding training rules and losing a jet…and sometimes much, much more. I've always been told that Dash-1 warnings and training rules are written in blood; I became a believer on this warm spring morning. There are many things to live for. While there are a few things worth dying for, satisfying your ego isn't one of them.

Takeoffs are an option,

landings are not.

DoD Photo by Capt. Mark D. Gibson, USAF

AGSM:

PREPARATION PRIOR TO QUALIFICATION

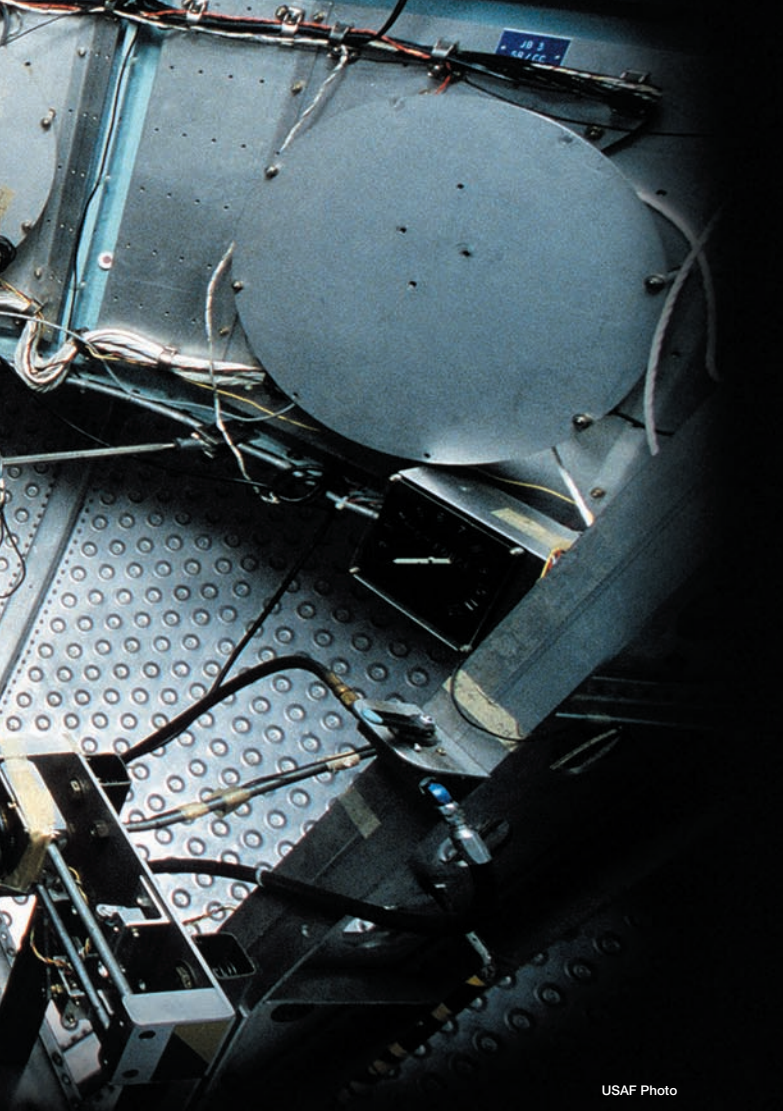
CAPT VIKKI THOMPSON
OIC Human Performance Training Team
49 ADOS/SGGT
Holloman AFB NM

SSGT MELVIN PACE
14 MDOS/SGOAT
Columbus AFB MS

G-forces have been and will continue to be a factor in fighter aircraft as well as trainers such as the T-37, T-6 and the T-38. Students are taught early-on during Specialized Undergraduate Pilot Training (SUPT) the importance of being able to overcome and sustain the Gs that will be placed on their bodies while flying. The consequences of not being able to perform a good Anti-G Straining Maneuver (AGSM) could be an incapacitating G-Induced Loss of Consciousness (G-LOC), possibly destruction of a jet or more importantly, losing one's life. This is why every Air Force pilot is given instruction on proper AGSM mechanics and tips for increasing AGSM performance during the first phase of physiology training.

The first time most students hear about this phenomenon is an academic class on acceleration during initial physiology training. They are taught the different types of acceleration, Linear, Radial and Angular, as well as the effect that each one has on the human body. Students are shown the factors determining the effects when the human body is subjected to both positive and negative Gs. With positive Gs, blood starts to pool (1-3 Gs) in the lower extremities; and coupled with a poor Anti-G Straining Maneuver the body will begin to experience visual gray-out (3-4 Gs), progressing to blackout (4-5 Gs) with the end result being loss of consciousness (5-6 Gs). The effect of pulling negative Gs is that blood is pushed up to the head; at 1-2.5 Gs vision starts to be affected, at 2.5-3 Gs extreme discomfort is experienced and, finally (at 3 or more Gs), incapacitation. Needless to say, the importance of performing a correct straining maneuver is stressed. Students are informed of the two types of G-LOC protection, the G-suit and of course the main source of protection, the G-strain. The physiologist provides them with the mechanics of a proper G-Strain. An effective lower body strain and the proper breathing cycle help to provide a good defense against both positive and negative G-forces.

After classroom instruction on the AGSM, each student is individually evaluated to determine if the maneuver is being performed correctly. Further instruction is provided to students who require additional assistance. The students are sent out to fly after finishing their initial physiology training and do not receive formal instruction again until they return for a Pre-Acro class, although they will return if a G-LOC incident occurs prior to that class. The Pre-Acro class is a refresher on the effects of Gs and G-LOC, proper performance of the AGSM and



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common errors leading to an improper AGSM. Each student's AGSM should be evaluated by their instructor pilot (IP) each time they fly. The students that are selected for the fighter track and proceed to fly the T-38 will receive another refresher class on their G-strain and be evaluated one last time prior to going to the centrifuge at Holloman AFB, NM to qualify for the T-38.

It is imperative to take lessons learned from academics prior to arrival for "Qualification Training." The technical and mechanical aspects of the AGSM are just the beginning. Nutrition, hydration and fitness are equally important to ensure high performance while under Gs. These aspects are also addressed during academics. At first glance, they seem insignificant, but make a difference in the capabilities of the student pilot and their ability to perform the AGSM in the aircraft and the centrifuge.

Nutrition and the impact on performance is nothing new, but many aviators still don't take the time to "fuel up" prior to a sortie. Students must make food choices that are nutrient dense and pack an energy punch so performance decrements will not be an issue while in the air. Even an energy bar 1-2 hours before flight will positively affect performance. It is important to make good nutrition a common practice before and during centrifuge training as well. Qualification day at Holloman is long and physically demanding. Not eating effectively throughout the day and before arrival can make the difference between success and failure.

Hydration is one of the easiest ways to maintain optimal performance. At 2 percent dehydration, the sensation of thirst is present. At 3 percent dehydration, the ability to pull Gs is significantly reduced. Just as drinking fluids is important for flying, the same holds true to centrifuge training. Hydrate well before arrival at Holloman, not only the night before, to ensure peak performance. Although many hydration choices exist, water is always the best bet. Limit sugary, caffeinated beverages and drink at least 9 eight ounce glasses of water a day. Remember also, higher activity levels require more fluids, so nine glasses may not adequately address hydration needs.

And finally, fitness is a key component of an effective Anti-G Straining Maneuver. Many students in the past have unwisely believed exercising a few weeks prior to qualification will allow for enough time to have significant increases in fitness. This is definitely not the case. At least two to three months are required to reap the benefits. A workout should contain both weightlifting/calisthenics and cardiovascular training. When weightlifting, opt for both strength (high weight/low repetitions) and endurance (low weight/high repetitions). This allows for the AGSM to be maintained for a prolonged period of time (15-30 seconds) at maximum strength. With cardiovascular training, strive for endurance and explosive power. An optimal cardiovascular program should contain both longer, less intensive workouts and short, explosive ones to train the heart to respond appropriately to the demand placed upon it. Flying consists of strength, power and endurance with every high G engagement that is performed. The same will hold true for centrifuge training. A significant number of AGSM issues identified are due to a lack of fitness.

Anti-G Straining Maneuver (AGSM) academics seriously impact the performance of student pilots during Specialized Undergraduate Pilot Training (SUPT) and ultimately the level of success achieved at the centrifuge. Integration of sound AGSM mechanics, good nutrition, proper hydration and an effective fitness program well in advance of centrifuge qualification are imperative to that success. Contact the Physiological Training Center at Holloman AFB (DSN: 572-5760) or talk to any SUPT physiological team member with questions or details about how to achieve optimal AGSM performance.

(Editor's Note: Since writing this article, Capt Thompson has separated from the USAF.)

Riskier To Not Fly?

CAPT MICHAEL LENHART
16 SOW
Hurlburt Field FL

"Sometimes it's riskier to not fly." This is what an experienced pilot in our squadron once said to me. At first, I thought it was quite possibly the most absurd notion I had ever heard. The more I thought about it, however, the more it began to make sense.

The risk assessment we conduct before flight takes into account the environment in which we plan to operate. In combat, the tendency is to understand that a given mission is essential, so our risk mitigation practices serve to find the best risk for the given mission. The risk we accept may not be eliminated or even minimized; it is a product of risk mitigation techniques and an analysis of costs versus benefits. In combat, aviators, planners and commanders tend to do this type of assessment well, and it shows. This type of decision-making and mission execution no doubt contributes to the recognized excellence of our Air Force.

If you've noticed, I have restricted the discussion thus far to combat operations. Oddly enough, this article is not about combat operations. The quote in the first line was in reference to continuation training at home. Sometimes, it's riskier to not fly.

When we return home after serving in combat operations, there seems to be a shift in how we as a community view risk, costs and benefits. The training sortie at home does not have the same perceived benefits tied to it as the combat missions flown in months prior. This paradigm shift is not entirely bad—I am in no way advocating that operations at home should exactly mirror those in combat. What I am advocating is that a closer look be given to the benefits of training.

If your unit is like mine and many others that I know, the training line takes on a very low perceived value when confronted with issues such as extended maintenance delays, scheduling difficulties, or other unplanned obstacles. This is where the notion that "It's safer to not fly" was born. "There is nothing we can do today that we can't do tomorrow." I challenge this notion, as it is not entirely accurate.

Training opportunities can be very limited. This seems to be a recurring theme throughout the Air Force. With continuing combat operations in more than one theater and continuous global operations, the availability of personnel and aircraft can be very limited. This problem is even further


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exacerbated if you are in a unit that operates what is considered to be *low-density, high-demand assets*. Regardless of what you operate, the problem is common throughout the Air Force.

So, why is it riskier to not fly? How is that even possible? Isn't it always safer to just not fly at all? The answer to this lies in one word. Proficiency.

In some units, "There is nothing we can do today that we can't do tomorrow" is a laughable concept. If you are unfortunate enough to be scheduled for only one or two proficiency sorties in a month, and one of those sorties goes away due to maintenance or a last minute DNIF, "There is nothing we can do today that we can't do tomorrow" becomes a downright lie. The training opportunity is lost, and adversely affects proficiency. This does not mean that there are no valid reasons to cancel training at home; there are, and there will continue to be. What this does mean is that we need to reassign a value to training in our cost-versus-benefit analysis.

A proficient crew has a high probability of operating and recovering an aircraft safely, even if said aircraft experiences mechanical difficulties or circumstances deviate substantially from what was planned. A non-proficient crew has a much lower probability of safely recovering an aircraft, even if said aircraft is 100% mechanically sound and everything goes as planned. The proficiency of the crew, be it a single-seat pilot or a large crew aircraft, serves as the critical link to mission success. Without it, mission failure and unacceptable losses of life and assets become much more likely. In short, the Air Force can't afford for its operators to not be proficient. There is risk involved.

The intent of this article is not to advocate operating at home like we do in combat, or to take a "cowboy" approach to risk management. The intent is to point out that there are risks involved when training is lost, and hopefully facilitate a more accurate assessment of what is at risk when training is canceled. This observation is often shadowed by the misperception that canceling a mission at home costs nothing. The cost associated with lost proficiency is not readily seen and its effects are insidious and difficult to recognize.

It is difficult to quantify what is actually lost when a training opportunity goes unfulfilled, which contributes to individuals assigning less value to the training event than is warranted. The backbone of any operational unit is its training program. The goal of that training program should be to introduce the skills, tactics, techniques and procedures that all lead to knowledgeable and proficient operators. What, where and how often we train directly impacts the combat effectiveness of any unit and any individual in that unit. The only way to extract those benefits from a training program is to maximize the flying training opportunities. Make the most of every sortie. Demonstrate the same type of will to make the training sortie happen that is prevalent in making combat missions happen—with the appropriate risk assessment and mitigation measures in place, of course. While the training mission should never require an operator to accept more risk than a combat mission, successful combat missions would not be possible without training missions. Assign the appropriate value to a sortie and determine if the benefits outweigh the costs. Lost training is not free.

The next time you experience maintenance, weather or some other delay and you are scheduled for a proficiency sortie, you will need to assess how the delay affects your initial risk management assessment. Steps such as simplifying the profile or eliminating certain aspects of the mission may very well be appropriate and needed in order to choose the best risk for a given mission. When making this assessment, however, remember one thing: canceling a training mission has its costs. Its cost is in terms of proficiency, or a lack thereof. After all, "Sometimes it's riskier to not fly."

Pocketknives and Stones

MAJ WILLIAM J. STRAUS
1 SOS
Kadena AB Japan

Every flight has its challenges and obstacles to overcome, but hackin' the mission is the name of the Special Ops game—"Any Time...Any Place." We are just a small part of the machine, supporting the guys bleeding for our great country. I don't take a single action in support of these heroes lightly, but on this dark and dusty night in the AOR, things were becoming routine, and I started to let my guard down. I would never slack on the primary mission, but after weeks of flying, I was tired of all the heavy stuff hanging off my bag and figured dressing to egress was secondary and more trouble than it was worth. Huge mistake. Could it happen to me? I didn't ask that question that night, and like everyone on the plane, I thought if we crashed, I'd grab my gun and survival gear on the way out. It's all hanging on my seat—no problem, right? Wrong. Bam! Like any good aviator's story, "There I was…"

After we slammed to a stop 2.4 miles off the end of the runway, in the middle of nowhere, smoke and dust everywhere, my first thought was, "I don't want to be that guy who survives a crash and burns to death inside the airplane." Seven guys, two Special Ops troops and five crew, scrambled out of a burning airplane, and I looked back to see a thousand-foot tower of flames. That was my last moment to say goodbye to two of the finest loadmasters I've ever known, as well as an Army veteran/father of five who had joined us just minutes before. We limped over a couple of hills and hunkered down to avoid the shrapnel of a trailer fully loaded with bullets and missiles now creating the most spectacular Fourth of July show I'd ever seen. At this point training took over: We're in bad-guy land, injured too badly to evade, but alive, and it was time to take inventory. Surely, somebody has a first-aid kit. Surely, somebody has a gun. Someone must have a radio or at least an ELT so we can contact the good guys. Uh…no. My first thought was the same as everyone else's, and we looked back to see everything we needed to survive melting to a puddle in the middle of the desert.

I had just helped carry the Pilot, with his broken ankle, out of a river of burning fuel. The Engineer was bleeding profusely from his face and the Nav was beat senseless by his seatbelt. Albeit alive, everyone needed medical help. Our life-support guys painstakingly packed everything they thought we could possibly need into our survival vests and we didn't have a single Band-Aid. The uncomfortable feeling I had wearing my vest was nothing compared to looking at my fellow crewmembers, broken and battered. What now?

OK, we had just survived a plane crash. None

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Photo Illustration by Dan Harman

of our injuries were life-threatening right then. We'll be OK, right? Right then, it seemed a little early to answer that question. We're not in Kansas anymore—we're fighting a war, and there are bad guys out here. The Army guys, who were in the back, said their guns were mangled in the wreck, so they jumped out thinking they'd just use the crew's. Once we combined our assets, we stared in disbelief at two lonely pocketknives. Quietly, I picked up a four-inch jagged rock and clutched it in my right hand, ready to defend myself to the last breath. Silly? Sure, probably even stupid, but I didn't even want to contemplate becoming a POW. Which is more uncomfortable, wearing a holster and gun while you fly a 10-hour mission, or sitting in the middle of a hostile foreign country we're at war with, hoping the good guys get to you first? At that point, the buzz of another C-130 circling overhead was my only sense of comfort. Good thing the Taliban was already scared $%#*less of gunships.

Speaking of which, surely those guys up there could hear us if we transmitted our location on our handy-dandy survival radio. If not them, then the rest of the guys at the field we had just left would ride over the hills in HMMWVs and rescue us, if we could just call them. Oh, right, fire has the same effect on radios that it does on aluminum, and they were melting right next to our guns. I now realized we were officially on our own, no survival gear, no guns and no radios, waiting to see who would find us first. To their credit, badly injured (broken vertebrate and cut up), our Army passengers set up a perimeter and ran circles around us for over an hour so as to be the first ones contacted regardless of who it was. Those radios may have seemed heavy when I was sitting in my nice comfortable aircraft seat, but I'd have given anything for one now.

Did we "Dress to Egress?" Not at all—we were way more interested in comfort than survival when we strapped into our all-powerful warfighting machine. Were we lucky that night? Yes, because our injuries were not immediately life-threatening, the good guys were watching us from above, our enemies didn't come over the hill first, and because we unquestionably have the best rescue forces in the world. Lessons learned never seem to come easy. We all learned a few valuable lessons that night. The equipment you're issued is not nearly as uncomfortable to wear as it is to be without when you need it. In the future, if I'm ever pulled from the wreckage of an aircraft, they will have to unzip my survival vest to get to my dogtags. What is strapped to your warm body when you take off is exactly what you'll have to survive on if you ever find yourself crawling from a burning pile of airplane. Plan ahead, and "Dress to Egress."

Expecting the Unexpected

1LT JOE TULLOSS
3 FTS/DOV
Moody AFB GA

"So, there I was…" I had heard this line over and over since the beginning of pilot training. I always sat with wide eyed interest, listening to my instructor pilots tell tales of woe from their respective weapons systems and from the T-6, always thinking that they were great stories...but, hey, it probably won't happen to me, right? So, there I was, leading a two-ship formation through some thick IMC…yep, prime conditions for an unforgettable "war story."

The mission, a student formation sortie against a crew of two IPs, began with the normal preflight brief, WX and NOTAMs check. Because of the marginal weather, we talked in depth about all the varying possibilities for recovering the formation back to base, something I would later be happy we covered in depth. All the ground operations, takeoff, and departure to the MOA went normally. We were into the clouds at around 1,000 feet, and in and out of layers up to 8,000, our final departure altitude before we hit the MOA. A couple of hundred feet after climbing into our working airspace, we hit another layer of clouds, so I decided to take the aircraft from my student and explore to see if any workable airspace could be found farther west. As an instructor pilot, my mind is always on safety first; however, I wanted to do my best to accomplish the mission. So, after discovering our workspace was totally socked in, I began to coordinate for some airspace at a higher altitude. Perhaps we'd break out on top with enough clear air, gas and time to complete the sortie.

We began climbing (still IMC) when all of a sudden the control stick started to get heavy.

"Are you on the controls?" I snapped at my student.

"Uh...no, sir."

The stick continued to get heavy as I realized that I had already subconsciously started trimming the opposite direction. About that time, all my Dash-1 knowledge kicked in, and I quickly mashed the trim interrupt button on the stick. I glanced down at my trim indication panel, but it was too late; the elevator trim indicator was stuck full nose-down.

Here we go, I thought. In the weather, with a guy on my wing, and flight control problems. This would be a great standup EP, I thought as I began to assess the situation. Well, I guess this is what I get paid the big bucks for. Time to get to work.

I continued to muscle the stick back, keeping the climb going into the high area, and told the student to open his checklist. I also let my wingman know I had a problem and to stand by. My first concern was getting to VMC, so I could get my wingman to a wider formation and deal with the problem without worrying about getting him or myself spatially disoriented. At 19,000 feet, with only 3,000 left to the top of the MOA, I began to worry that we were not going to break out on top. Just as I was about to call ATC, my student chimed in, "Hey, sir, uh, it looks like we're starting to pick up ice on the windscreen and leading edges." All right, this is about to get really interesting, I thought. Thankfully, about fifteen seconds later, while discussing the situation and my options with my wingman, we began to see some sun, and eventually popped out on top with about 1,500 feet of airspace to work with. Finally, a break.

After running through the checklists, we decided that we had a couple of factors to deal with. First, we definitely wanted to do a controllability check; we had to determine if we had enough aft stick author-

In the weather, with a guy on my wing, and flight control problems...

USAF Photo

ity for a flare and landing. However, the checklist says that once we drop the gear, we're not supposed to bring it back up. Did I really want to descend back through icing and into the rapidly changing south Georgia weather, not knowing whether I'd break out with enough clear air to do the controllability check, or if we'd break out on the ILS approach? Did we have enough gas for the divert?

Time to start working the CRM. My wingman started running the divert fuel calculations, while I talked to squadron ops and the supervisor of flying (SOF), and declared the emergency with RAPCON. After getting everyone in the loop, we decided on the advice of the SOF to descend clean for the controllability check and configure, hopefully, after we broke out below the weather. Unknown to us, the weather had changed significantly enough to allow a descent for the controllability check. We executed the plan as advertised, broke out in between cloud layers, and did the flight control check, all uneventfully. Finally we picked up vectors for the ILS, and brought it home for an uneventful minimum flare touchdown.

Lessons learned? First, during most EPs there is no need to rush. Prioritize and take everything one step at a time. Secondly, use your resources. Run the plan through the other guy in the jet, your wingman (kudos to my wingman for being there, for backup on the checklist, and for experienced advice), and the guy on the ground—he may have the most current WX info available and some invaluable ideas that could keep you from making a bad call in the "heat of battle." And lastly, it's good to know that the skills developed from all the countless EPs I've received, and given to my students, are invaluable for bringing home the aircraft, which can malfunction at some very inopportune times.

You never know when it might be your day for a "So, There I Was…"

WEATHER QUIZ

Advanced Instrument School
Randolph AFB TX

Weather is something aviators must deal with every time we fly. Are you a meteorological marvel? Have you mastered the METAR? Let's see how you "weather" this quiz.

1. METAR refers to a scheduled observation taken between 55-59 minutes past the hour…SPECI (Special Report) refers to an unscheduled observation that meets predefined criteria (significant weather change) and may be taken at any time within the hour.
   a. True
   b. False

2. What is the difference between SKC and CLR in METAR reports?
   a. SKC is reported at manual stations when the sky is clear, and CLR is reported at automated stations when the sky is clear.
   b. CLR is reported at manual stations when the sky is clear, and SKC is reported at automated stations when the sky is clear below 12,000 feet.
   c. SKC is reported at manual stations when the sky is clear, and CLR is reported at automated stations when the sky is clear below 12,000 feet.
   d. SKC and CLR are interchangeable.

3. "VCSH" in a METAR report means:
   a. Volcanic ash.
   b. howers in the vicinity.
   c. Showers very close to the observation point.
   d. Virga and showers.

4. In a METAR report, "FEW025" describes a scattered layer at 2500 feet that covers 1/8 to 2/8 of the sky, while "SCT025" indicates that the layer covers 3/8 to 4/8 of the sky. But what does "FEW000" mean?
   a. Scattered layer covering 1/8 to 2/8 of the sky, height unknown.
   b. Sky partially obscured, obscuration covering 1/8 to 2/8 of the sky.
   c. Scattered layer covering 1/8 to 2/8 of the sky, height greater than 12,000 feet (reported only by AWOS stations).
   d. It is not a valid METAR sky cover group.

5. What does "1 1/2SM BRFU" mean in a METAR?
   a. Visibility one and one half miles with smoke, blowing rain, patchy fog.
   b. Visibility one and one half statute miles with patchy ground fog.
   c. Visibility one and one half miles with smoke and patchy ground fog.
   d. Visibility one and one half statute miles with mist and smoke.

6. Mountain wave turbulence will always be accompanied by the characteristic cap, rotor, and lenticular clouds indicating extreme turbulence.
   a. True.
   b. False.

7. Which statement is correct concerning the following METAR report?
   KMCF 202356Z 34008KT 2SM -RA BR SCT005 BKN010 OVC040 14/13 A2998 RMK SLP126
   a. The ceiling is 500 feet AGL.
   b. The ceiling is 1,000 feet AGL.
   c. Runway 12 visual range is 600 meters.
   d. The sky is totally obscured.

8. Cold weather altimeter corrections are designed to adjust published instrument approach procedure altitudes to ensure adequate obstacle clearance. This adjustment becomes important in temperatures lower than standard since:

a. The aircraft's altitude is above the figure indicated by the altimeter.
b. the aircraft's higher true airspeed decreases the required obstruction clearance radius.
c. the aircraft's altitude is below the figure indicated by the altimeter.
d. both a and b above.

9. During your preflight weather briefing for an IFR flight, the TEMPO visibility at your destination is forecast to be less than that required for the approach you intend to fly. TEMPO visibility:
a. prevents you from filing to that destination.
b. is informative only and need not be considered in flight planning.
c. may not require an alternate if associated with thunderstorms.
d. is not restrictive for destination filing purposes, but an alternate may be required.

10. Regardless of weather, pilots must designate an alternate airport on all IFR flight plans when filing to a destination where:
a. all compatible approaches require radar.
b. GPS is the only available navaid.
c. the destination has no weather reporting capability.
d. all of the above.

11. Which is true about the amended forecast for NTU?
NTU 1109 AMD VRB05KT 9999 SCT012 BKN040 OVC080 QNH3013INS CIG020 VCTS
TEMPO 1114 1600 -SHRA BR
FM15 07007KT 9999 NSW SCT020 BKN080 BKN250 QNH3012INS CIG030 VCTSSHRA
TEMPO 1801 3200 TS SHRA BR BKN010 OVC015 CIG010
FM03 16010KT 9999 SCT025 BKN040 BKN080 OVC250 QNH3015INS
CIG040 VCSHRA WND 18008KT AFT 06 AMD 1116

a. The intermittent conditions at 1300 Zulu calls for about 1 mile visibility.
b. The ceiling at 1500 Zulu is broken at 25,000 feet.
c. The wind at 0500 Zulu will be160 at 10 kts.
d. Both a and c.

12. So, you think you might want to sneak beneath a thunderstorm to make a VFR approach into your homeport. Our rule-of-thumb for doing that: Don't! Often the visibility can be quite good where the rain isn't falling, but severe turbulence can be expected beneath a thunderstorm, especially when the relative humidity is low in any layer between the surface and 15,000 feet.
a. True
b. False

13. Below Flight Level 180, En Route Flight Advisory Service (EFAS) or "Flight Watch" is an en route weather service that uses the common frequency
a. 121.5
b. 122.0
c. 122.5
d. 123.0
e. 123.5

14. What is the meaning of "RAB05E30" in a METAR or SPECI report?
a. Rain and mist obscuring the sky from 500 feet (estimated) to 3000 feet.
b. Reported braking on the runway indicates need for 5% to 30% (estimated) increase in landing distance.
c. Rabbits reported on runways 5 and 30.
d. It rained for 25 minutes during the period covered by the report.

15. You are reviewing a METAR report and see the following: "+TSRAGR." What does this mean?
a. Heavy thunderstorm, snow, rain, and snow grains.
b. Thunderstorm, heavy rain, and hail.
c. Severe thunderstorm, rain, and hail.
d. Severe thunderstorm, rain, ground fog.

answers on page 30

Safety Award Winners

A. Secretary of the Air Force Safety Award
Category I: United States Air Forces in Europe
Category II: Air Force Operational Test Center

B. Major General Benjamin D. Foulois Memorial Award
Pacific Air Command

C. Colonel Will L. Tubbs Memorial Award for Ground Safety
Category I: Air Combat Command
Category II: United States Air Force Academy

D. Koren Kolligian, Jr., Trophy
Capt Andreas Ix, 58 AS, Altus AFB OK (AETC)

E. Colombian Trophy
4th Special Operations Squadron, Hurlburt Field FL (AFSOC)

F. System of Cooperation Among the Air Forces of the Americas (SICOFAA) Flight Safety Award
317th Airlift Group, Dyess AFB TX (AMC)

G. Chief of Staff Individual Safety Award
Lt Col Tracy Dillinger, HQ AFSC, Kirtland AFB NM (AFSC)

H. Safety Career Professional of the Year Award
SMSgt Stephen Benoit, 435 ABW, Ramstein AB GE (USAFE)

I. Air Force Nuclear Surety Outstanding Achievement Award
TSgt Lewis Long, 509 BW, Whiteman AFB MO (ACC)

J. Air Force Explosive Safety Outstanding Achievement Award
MSgt Antonio Berry, 18 WG, Kadena AB JA (PACAF)

K. Air Force Chief of Safety Outstanding Achievement Award for Ground Safety
Category I: Ogden Air Logistics Center, Hill AFB UT (AFMC)
Category II: 48th Fighter Wing, RAF Lakenheath UK (USAFE)
Category III: 33d Fighter Wing, Eglin AFB FL (ACC)
Category IV: 353d Special Operations Group, Kadena AB JA (AFSOC)
Category V: 724th Air Mobility Squadron, Aviano AB IT (AMC)

L. Air Force Chief of Safety Special Achievement Award
119th Fighter Wing, Fargo ANG ND (ANG)

M. Air Force Chief of Safety Aircrew of Distinction Award
Capt Lars Johnsen, Capt Thomas Staley, 1st Lt Michael Gard, MSgt Brian Johnson, MSgt Christopher Vonvultee, SSgt Gregory Everett, TSgt Jeffrey Begley, SrA Daniel Schrodt, 43 AW, Pope AFB NC (AMC)

N. Air Force Chief of Safety Medical Achievement Award
Human Performance Training Team, 509 MDOS, Whiteman AFB MO (ACC)

O. Air Force Chief of Safety Space Crew of Distinction Award
XSS-11 Space Operations Crew, SMC, Kirtland AFB NM (AFSPC)

P. Air Force Directed Energy Weapons Safety OutstandingAchievement Award
Safety & Environmental Compliance Team, Directed Energy Directorate, AFRL, Kirtland AFB NM (AFMC)

Q. Safety Plaque Recipients:

1. Air Combat Command Flight:
1st Fighter Wing, Langley AFB VA
4th Fighter Squadron, Hill AFB UT
27th Fighter Wing, Cannon AFB NM
34th Fighter Squadron, Hill AFB UT
388th Fighter Wing, Hill AFB UT
421st Fighter Squadron, Hill AFB UT
43d Electronic Combat Squadron, Davis-Monthan AFB AZ

Missile:
27th Fighter Wing, Cannon AFB NM
388th Fighter Wing, Hill AFB UT
83d Fighter Weapons Squadron, Tyndall AFB FL
5th Bomb Wing, Minot AFB ND
33d Fighter Wing, Eglin AFB FL

Explosives:
388th Fighter Wing, Hill AFB UT
23d Fighter Group, Pope AFB NC
9th Munitions Squadron, Beale AFB CA
33d Fighter Wing, Eglin AFB FL
7th Munitions Squadron, Dyess AFB TX
27th Fighter Wing, Cannon AFB NM
49th Fighter Wing, Holloman AFB NM
366th Fighter Wing, Mountain Home AFB ID
2d Bomb Wing, Barksdale AFB LA
1st Fighter Wing, Langley AFB VA
28th Bomb Wing Ellsworth AFB SD
55th Maintenance Munitions Flight, Offutt AFB NE

Nuclear Surety:
5th Bomb Wing, Minot AFB ND

2. Air Education and Training Command Flight:
56th Fighter Wing, Luke AFB AZ
71st Flying Training Wing, Vance AFB OK
550th Special Operations Squadron, Kirtland AFB NM

3. Air Force Materiel Command Flight:
USAF Test Pilot School, Edwards AFB CA

Missile:
526th ICBM Systems Wing Safety Team, Hill AFB UT

Explosives:
898th Munitions Squadron, Kirtland AFB NM
651st Munitions Squadron, Lackland AFB TX
649th Munitions Squadron, Hill AFB UT

Nuclear Surety:
898th Munitions Squadron, Kirtland AFB NM
896th Munitions Squadron, Nellis AFB NV

4. Air Force Reserve Command Flight:
315th Airlift Wing, Charleston AFB SC
349th Air Mobility Wing, Travis AFB CA
439th Airlift Wing, Westover ARB, MA
944th Fighter Wing, Luke AFB AZ

5. Air Force Special Operations Command Flight:
4th Special Operations Squadron, Hurlburt Field FL
8th Special Operations Squadron, Eglin AFB FL
9th Special Operations Squadron, Hurlburt Field FL
16th Special Operations Squadron, Hurlburt Field FL
353d Special Operations Group, Kadena AB JA

Explosives:
16th Special Operations Wing, Hurlburt Field FL

6. Air Force Space Command Flight:
30th Space Wing, Vandenberg AFB CA
37th Helicopter Flight, F.E.Warren AFB WY

Missile:
30th Space Wing, Vandenberg AFB CA
90th Space Wing, F.E. Warren AFB WY

Explosives:
90th Space Wing, F.E. Warren AFB WY
30th Space Wing, Vandenberg AFB CA
341st Space Wing, Malmstrom AFB MT

Nuclear:
90th Space Wing, F.E. Warren AFB WY

Space:
45th Space Wing, Patrick AFB FL

7. Air Mobility Command Flight:
6th Air Mobility Wing, MacDill AFB FL
19th Air Refueling Group, Robins AFB GA
22d Air Refueling Wing, McConnell AFB KS
43d Airlift Wing, Pope AFB NC
54th Airlift Squadron, Wright-Patterson AFB OH
61st Airlift Squadron, Little Rock AFB AR

92d Air Refueling Wing, Fairchild AFB WA
311th Airlift Squadron, Peterson AFB CO
317th Airlift Group, Dyess AFB TX
375th Airlift Wing, Scott AFB IL
436th Airlift Wing, Dover AFB DE
457th Airlift Squadron, Andrews AFB MD
458th Airlift Squadron, Scott AFB IL

Explosives:
436th Airlift Wing, Dover AFB DE
375th Airlift Wing, Scott AFB IL
723d Air Mobility Squadron, Ramstein AB GE
305th Air Mobility Wing, McGuire AFB NJ
43d Airlift Wing, Pope AFB NC
62d Airlift Wing, McChord AFB WA

Nuclear Surety:
62d Airlift Wing, McChord AFB WA

8. Air National Guard Flight:
119th Fighter Wing, Fargo ANG ND
171st Air Refueling Wing, Pennsylvania ANG PA
180th Fighter Wing, Toledo ANG OH
189th Airlift Wing, Little Rock AFB AR

9. Pacific Air Forces Flight:
35th Fighter Squadron, Kunsan AB Korea
44th Fighter Squadron, Kadena AB JA
65th Airlift Squadron, Hickam AFB HI
67th Fighter Squadron, Kadena AB JA
374th Airlift Wing, Yokota AB JA
961st Airborne Air Control Squadron, Kadena AB JA

Missile:
18th Wing, Kadena AB JA
3d Wing, Elmendorf AFB AK

Explosives:
36th Munitions Squadron, Andersen AFB GU
18th Wing, Kadena AB JA
354th Fighter Wing, Eielson AFB AK
374th Airlift Wing, Yokota AB JA

10. United States Air Forces in Europe Flight:
22d Fighter Squadron, Spangdahlem AB GE
56th Rescue Squadron, Keflavik Iceland
81st Fighter Squadron, Spangdahlem AB GE
85th Operations Squadron, Keflavik Iceland
494th Fighter Squadron, RAF Lakenheath UK

Missile:
48th Fighter Wing, RAF Lakenheath UK

Explosives:
435th Air Base Wing, Ramstein AFB GE
52d Fighter Wing, Spangdahlem AB GE
48th Fighter Wing, RAF Lakenheath UK
52d Equipment Maintenance Squadron, Spangdahlem AB GE

Nuclear Surety:
48th Fighter Wing, RAF Lakenheath AB UK

R. Aero Club Certificates:
Air Combat Command
Barksdale Aero Club
Beale Aero Club
Lemay Flight Training Center Aero Club
Air Force Materiel Command
Griffiss Aero Club
Hanscom Aero Club
Robins Aero Club
Air Mobility Command
Dover Aero Club
Scott Aero Club
Pacific Air Forces
Kadena Aero Club
Yokota Aero Club
Elmendorf Aero Club
United States Air Force Academy Aero Club
Air Force Reserve Center, March Aero Club
Air Force Space Command
Patrick Aero Club
Rocky Mountain Flight Training Center Aero Club

Answers to Weather Quiz

1. a. AF Pamphlet 11-238
2. c. AFH 11-203, Vol. 3, para 12.5.3
3. b. AF Pamphlet 11-238
4. b. AF Pamphlet 11-238
5. d. AF Pamphlet 11-238
6. b. AFH 11-203, Vol. 1, para 9.5.1.1
7. b. AFH 11-203, Vol. 2, para 3.1.8, 3.1.10
8. c. AFMAN 11-217, Vol 1, para 8.1.4
9. d. AFMAN 11-217, Vol 1. para 8.3.3.4
10. d. AFI 11-202, Vol 3, para 8.4.2.1.1, 8.4.2.1.2, 8.4.2.1.4
11. d. Flight Information Handbook(FIH) Section C
12. a. AIM 7-1-29(d)
13. b. FIH page C-47
14. d. AF Pamphlet 11-238
15. b. AF Pamphlet 11-238

FY06 Flight Mishaps (Oct 05-Mar 06)

9 Class A Mishaps
0 Fatality
3 Aircraft Destroyed

FY05 Flight Mishaps (Oct 04-Mar 05)

16 Class A Mishaps
1 Fatalities
5 Aircraft Destroyed

09 Oct		An F-16C departed the runway on landing rollout; pilot egressed safely.
20 Oct	✶	An F-22A ingested an NLG safing pin into the #2 engine; no intent for flight.
21 Oct	✶	An MQ-9L landed short of runway; gear collapsed.
24 Oct	✶	An Aerostat was destroyed during a hurricane.
28 Oct		An F-16C departed the runway on landing rollout; pilot egressed safely.
02 Nov		A C-5A had a #2 MLG bogie fire after landing.
17 Nov		A C-17 had a #4 engine compressor stall and fire.
28 Nov		An F-16C departed the runway on landing rollout; pilot egressed safely.
06 Dec		An A-10A had a landing gear collapse on takeoff.
13 Dec	✈	A T-38 had a bird strike; aircraft crashed, pilots ejected safely.
17 Jan	✈	An F-15C crashed into the ocean; pilot ejected OK.
06 Feb		A B-2A had #3 engine vibrations on takeoff roll, fan blade liberated.
14 Mar	✈	An F-16C experienced buffeting and uncommanded pitch/roll; pilot ejected safely.

Editor's note: The 6 Dec mishap was declared a non-rate producer, as there was no intent for flight; the 13 Dec F-15C mishap was downgraded to a Class B.

- 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 23 Mar 06**.

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