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Airfield Environment

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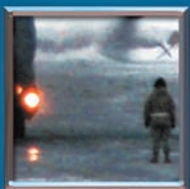

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U.S. AIR FORCE

Flying Safety Magazine on line: http://afsafety.af.mil/magazine/htdocs/fsmfirst.htm

SAFETY SAGE

CHANGES...

In the last issue of *Flying Safety* (July), the AF Chief of Safety, Maj Gen McFann, announced that we would be decreasing our publishing schedule to bi-monthly. Recently, our funding has been restored, and we will be returning to the regular monthly schedule.

However, in the interim, there are some glitches we need to explain. The May issue of *Flying Safety* exists only on the web. The June and August issues were not printed, and we're starting up again with this, the September issue. We apologize for any confusion this has caused, and we look forward, as always, to your feedback on how we're doing.

One more thing: Enclosed with this issue, you will find the 2005 version of our annual Mailing Verification Form. In the interest of economy, we have removed from our distribution list any addressees who have not responded to that form recently. Please take a moment to fill this latest form out and mail or FAX it back to us.

Thanks

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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. 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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Taxi Near-Accident

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It was a sunny winter day at our Alaskan air patch, and this staff officer was more than happy to be taking our mighty C-130 whisper-jet out for a quick jaunt around the state. Escaping from sight of the flagpole is always good!

There had been a heavy snow the night before, and, as I already mentioned, it was sunny. As it happens, it was just a bit above freezing. Warm enough, in fact, to melt a thin water layer beneath the snow. On the highway driving into the squadron, I realized it was unusually slick on the roads. This should have been a clue to trouble ahead, but of course, it wasn't. It's often slick on Alaska roads; no special cause for alarm.

At the squadron, the slip-sliding continued on the walk inside. The parking lot hadn't been plowed yet, and getting inside without falling down was a challenge. Actually, I failed that challenge, and fell at one point. This must be why we carry such big pubs bags; they cushion a fall and make a steady rest. Still, a slick parking lot in Alaska is not exactly alert-the-media material. So, nobody on the crew really realized what a challenge aircraft ground ops might be.

During mission planning we diligently checked the runway and taxiway condition. Taxiways were RCR 7...pretty slippery! But better than the local minimums required, so off we went.

Ground ops were an Alaska-sized challenge. Cargo loading and fleet service were delayed by the slippery conditions, and of course, the Herk needed a heavy dose of anti-icing. We were hurrying to make takeoff time as we cranked the big fans and prepared to depart the fix. In the distance, we watched from our nice, toasty flight deck, as a bread truck did donuts on the ramp. At last, it began to sink in: Whatever the RCR was, it was considerably worse than a 7. In fact, we were preparing to move a 145,000-pound hockey puck across a giant skating rink! Hopefully, we could keep it moving towards the goal.

Now, taxiing on ice in the mighty Herk is a challenge, but not an impossibility. The key is to keep it moving slowly, giving the big fat tires as much chance as possible to grip. The nosewheel won't grip well, or at all, so turning is accomplished with differential power. Push the No. 1 engine forward while pulling No. 4 back, and the airplane *will* turn to the right. Maybe the nosewheel will caster with the turn—but if it's very slick, it won't. In fact, since the copilot doesn't have access to nosewheel steering, he'll occasionally take the opportunity to taxi this way...on days much better than today, of course.

So, the marshaller signaled our turn, and we left our parking space. Your trusty aircraft commander pushed up the No. 1 engine, steered to the right, and pulled No. 4 back to help it along.

The marshaller abruptly signaled us to stop.

We tried it again. He signaled a turn, I got us going, and again, inexplicably, was signaled to stop.

"Gosh darn it!" I said. "Every time I get us going, he foolishly stops us!" (Perhaps I have edited my remarks slightly.)

USAF Photo by TSgt Scott T. Sturko

We downsped the engines, dropped the crew entrance door, and on-loaded the marshaller. He asked us, "Were you meaning to turn the nosewheel left for your right turn?"

Yes, really...the nosewheel steering cables were crossed! I moved the nosewheel right, the indicator went right, but the wheels went left. Surprise!

I learned a few important lessons from that day.

First, you can be sure I do a more careful preflight now. Sure, we check the condition of the steering cables, and even check to see if they're crossed. But they never are crossed, so, we don't know exactly what that looks like. Also, being merely human, we probably give that step a little less attention than we should since we never, ever, see what we're looking for there. So, on the one day that the cables actually were crossed, I (and others) missed it.

Second, ALWAYS follow the marshaller. They can see things you can't. In this case, his vigilance saved the day.

Third, I do a more careful risk analysis before I step. Yes, there's a real-life application of ORM. In this case, we had all the clues we needed that, no matter what base ops was calling the RCR, actual conditions on the C-130 ramp were not suitable for taxiing. Assuming this hazard was unacceptable, what could we have done to control it? One answer would have been to call for the snowplows and sanding trucks to dust our side of the base. Waiting might also have helped the sun to melt the worst of the slush. There were several options available to us before I'd have to go to the DO and explain that it just wasn't a day to fly. That's an option, too, although it's not one we look forward to trying.

Finally, I have increased respect for taxiing on snow and ice. Sure, we manage fairly well in everyday ops—but throw in a simple mechanical problem, and things get ugly in a hurry.

Sure, we didn't actually move anywhere. But imagine if the marshaller hadn't looked at the nosewheel and just waved the wands. On most any other day, we would have figured out the problem in the first few feet of taxiing. But with the ramp as slick as it was, it would have been quite possible to taxi on differential power without noticing a problem at all.

Imagine if we had taxied up to the parallel, then the nosewheel tires finally grip...and we go off into a ditch. Or perhaps the parallel is slick, too, and we taxi up to the runway. I shudder to think: What if we had gotten *on* the runway? Would we have departed the runway at high speed? Or managed a successful takeoff, only to have a much worse situation landing at the destination?

Happily, we will never know how badly this story could have ended. This accident chain had multiple links in place—the crossed steering cables, the engineer and I not noticing it on the preflight, and the unusually slick conditions. The chain was broken, however, when the marshaller noticed the problem and brought it to our attention. Happily, then, we can read about it in a "There I Was" story instead of an accident report.

DoD Photo by SSgt D. Myles Cullen

INSTRUMENT QUIZ

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So, by now you should all know the new AFMAN 11-217, Volume 1, has been released for your viewing pleasure. Keeping this in mind, let's see how much you have been in the books. The goal is to make you aware of some of the subtle changes that have been made in the latest version. All questions have been taken directly out of AFMAN 11-217, Volume 1. You have the tools; now let's see how you use them. Best of luck!

1. Text depicted in ***bold italics*** in AFMAN 11-217, Volume 1 are:
   a. optional based on the situation.
   b. procedure.
   c. purely recommended techniques; adhere to MAJCOM directives.
   d. does not apply to AFMAN 11-217, Volume 1.

2. Since we are moving to a paperless Air Force, when may a pilot print and fly an IAP from the Digital Aeronautical Flight Information File (DAFIF)?
   a. When no other IAP exists for that location.
   b. When the location is forecasted to be VMC +/- 1 hour of arrival.
   c. Never. Always use the IAP distributed via printed FLIP until the DAFAF is certified for IFR terminal use in the specific weapon system
   d. Only after pilot has completed required MAJCOM-directed DAFAF database training.

3. The types or combinations of onboard equipment required to file and fly RNAV include:
   a. INS
   b. TACAN/VOR/DME-based FMS.
   c. Integrated/Embedded GPS.
   d. Loran-C.
   e. All of the above.

4. On procedures depicting a ground track, pilots are expected to:
   a. correct for magnetic variation.
   b. correct for known winds.
   c. slow to holding speed.
   d. all of the above.

5. True or False: Receiver Autonomous Integrity Monitor (RAIM) or equivalent verification is required in order to use GPS for IFR navigation.

6. True or False: While flying IFR in uncontrolled airspace under an IFR clearance, pilots are required to maintain VMC and/or VFR cloud clearances.

7. USAF pilots may plan an instrument departure using raw obstacle data if:
   a. they have access to current aeronautical charts, FLIP and ASRRs.
   b. they have graduated from the Air Force Advanced Instrument School.
   c: both a and b.
   d: USAF aircrews may not construct their own departure procedures.

8. Maximum holding airspeeds are defined by TERPS; however, USAF aircrew may deviate:
   a. after prior approval has been coordinated with the local TERPS agency.
   b. from these speeds since they are only recommendations and the holding pattern has been designed with ample room for error.
   c. Never, unless noted. Holding airspeeds defined by TERPS have nothing to do with holding speeds specified in the aircraft flight manual.
   d. if in VMC and all obstacles can be visually avoided.

9. While in holding, limit bank angles to 30 degrees, 3 degrees per second or the bank angle commanded by the flight director unless:
   a. using non-standard turns to the left.
   b. holding below 14,000 feet MSL.
   c. holding directly over a TACAN.
   d. correcting for known winds.

10. In the interest of consistency, the USAF has adopted the ICAO definition of "established on course," which is:
   a. half full-scale deflection for an ILS/VOR/TACAN/RNAV/GPS.
   b. +/- 5 degrees of the required bearing for an NDB.
   c. CDI case break.
   d. a and b.

11. True or False: Terminal routings from an en route or feeder facility (which usually provide a course, range and minimum altitude to the IAF) are considered segments of an IAP.

12. True or False: If you are receiving radar vectors in the low altitude structure, you have the option to fly the final approach using either the High or Low approach book.

13. Pilots entering the Terminal Arrival Area (TAA) on an RNAV approach and cleared for the approach are expected to:

a. proceed directly to the IF/IAF holding pattern for the Straight-In Area, complete one turn in holding for the alignment maneuver and proceed in-bound for the approach.

b. maintain the last assigned altitude and proceed directly to the appropriate Right Base, Left Base or Straight-In Area IAF and commence the approach.

c. proceed directly to the IAF associated with that area of the TAA at the altitude depicted, unless otherwise cleared by ATC.

d. None of the above.

14. When flying a stand-alone GPS procedure, it is prudent to monitor a backup approach when available. If the GPS signal becomes unreliable and you are still outside the FAF:

a. ATC expects you to transition to the backup approach and requires no further clearance.

b. enter holding at the FAF (standard turns) and attempt to re-acquire a reliable GPS signal.

c. disengage auto-pilot (if coupled) and execute the published missed approach (for the backup approach) from the point of signal loss.

d. obtain clearance from ATC and transition to the backup approach.

15. "Runway Environment" is defined as:

a. approach lighting system, threshold, threshold markings or threshold lights.

b. runway end identifier lights, runway, runway markings, runway lights, visual slope indicator.

c. touchdown zone, touchdown zone markings or touchdown zone lights.

d. rotating beacon (at military locations).

e. a, b and c.

16. A descent below MDA is not authorized until sufficient visual references with the runway environment have been established and the aircraft is in a position to execute a safe landing. Assuming you have answered question 15 correctly and you have the runway environment in sight, when may you descend below 100 feet above the TDZE?

a. Pilot not flying (PNF) calls "Runway in sight."

b. PNF calls "Land" and you are in a safe position to land.

c. You have the threshold and VASI lights in sight.

d. The red termination bars or red side row bars are visible and identifiable.

17. If unable to accept an ILS/PRM approach, notify ATC:

a. prior to entering Class B airspace via phone patch or appropriate FSS.

b. no need to contact ATC, just transition to the most precise approach available.

c. prior to departure IAW FLIP AP to coordinate alternative arrival procedures.

d. prior to contacting approach control to allow time for de-conflicting arrival traffic.

18. While flying a side-step maneuver, pilots are normally expected to commence the side-step maneuver:

a. as soon as possible after the runway or runway environment is in sight.

b. only after passing the FAF.

c. if no other approach is available.

d. b and c.

19. While executing an actual missed approach, ensure your aircraft can achieve the published climb gradient. When the gradient is not published, climb at least:

a. 152 feet per nautical mile in order to clear obstacles.

b. 200 feet per nautical mile. If unable to meet the 200 feet per nautical mile, you are cleared to reduce the requirement to 152 feet per nautical mile.

c. 200 feet per nautical mile in order to clear obstructions.

d. 200 feet per nautical mile unless your MAJCOM directives state otherwise.

20. If you are flying outside U.S. National Airspace, apply ICAO instrument procedures:

a. only after receiving the proper MAJCOM ICAO training.

b. unless flying into a USAF installation using DoD FLIP.

c. unless otherwise published.

d. in non-English speaking countries.

ANSWERS

1. B: AFI 11-217, Volume 1, page 1
2. C: AFI 11-217, Volume 1, paragraph 8.5.1.2.1.1
3. E: AFI 11-217, Volume 1, paragraph 7.11.1.2
4. B: AFI 11-217, Volume 1, paragraph 7.1.1
5. True. See AFI 11-217, Volume 1, paragraph 7.12.2.6
6. False. See AFI 11-217, Volume 1, paragraph 8.7.2
7. D: AFI 11-217, Volume 1, paragraph 9.3.3
8. C: AFI 11-217, Volume 1, paragraph 10.2.4
9. D: AFI 11-217, Volume 1, paragraph 10.3.3
10. D: AFI 11-217, Volume 1, paragraph 11.3
11. True. See AFI 11-217, Volume 1, paragraph 11.5.1
12. False. See AFI 11-217, Volume 1, paragraph 13.1.2
13. C: AFI 11-217, Volume 1, paragraph 13.10.7
14. D: AFI 11-217, Volume 1, paragraph 13.10.14.1
15. E: AFI 11-217, Volume 1, paragraph 14.2.1.2.6
16. D: AFI 11-217, Volume 1, paragraph 14.2.1.2.6.1
17. C: AFI 11-217, Volume 1, paragraph 14.9.5.1.3
18. A: AFI 11-217, Volume 1, paragraph 15.7.2
19. C: AFI 11-217, Volume1, paragraph 16.4.3
20. C: AFI 11-217, Volume 1, paragraph 18.1.3.1

Reality And Perception: ORGANIZING YOUR BAG OF TRICKS

Photo Illustration by Dan Harman

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Reality: That which is real; an actual existence.
Perception: Recognition and interpretation of sensory stimuli based chiefly on memory. (American Heritage Dictionary)

Notes courtesy of the Runway Supervisory Unit during Undergraduate Pilot Training, such as IF, FTD (Incomplete Flare, Firm Touchdown) and BKIH (Burger King is Hiring), informed me that my perception of the rapidly approaching concrete was not sufficiently tuned to reality. Granted, the monkey skills necessary to successfully transfer intended outcome into actual outcome were also in the infant stages of development. However, these skills would not have a chance to mature without an accurate perception of the up-rushing ground in the first place. Although we may seldom admit it, none of us are strangers to the fact that it is our perceptions that determine how we act, and only to the degree that those perceptions mirror reality do we act upon reality itself.

Many an instructor worked to make me a safer pilot by adding to a "bag of tricks." As more and more tricks get added to the bag, the issue becomes their organization and readiness in time of need. When you really cut to the chase of things like ORM, CRM, (insert Air Force-sponsored TLA of choice here—Three Letter Acronym, that is), again and again we come face to face with that familiar yet deceptively elusive animal called common sense. So, why did the Air Force go to such great lengths to develop, implement and teach these monstrosities if, in the end, they are just fancy ways of arriving at common sense? These tools, or rather philosophies of operation, facilitate a common-sense conclusion by organizing a framework of facts to the user. That framework of facts is called—you guessed it—reality.

January 2003 found me in the tropical island paradise of Oman, from which we based 13-hour E-3 sorties into Afghanistan. Returning before dawn one morning, we prepared for the conclusion of a comparatively short 12-hour sortie. I, as the copilot, was flying the rare and challenging ILS to a full stop; all the instruments indicated normally. About five miles out, we noticed that where the runway should have been, instead there was a gaping pitch-black expanse. We asked the tower controller if the approach and runway lights were on, and back came the less-than-confidence-inspiring response, "Uh…my entire panel just went blank…hold on a minute…" We elected to go around at approach minimums (after seeing nothing). We made a second attempt with similar results. To make a long story short, we calculated that we had sufficient fuel remaining to hold until the sun came up, and that's exactly what we did.

OK, the safety geek hat is on, but this is important. In the ORM process, *identifying the hazards* (with their associated exposure, severity and probability) allows us to *assess the overall risk*. In the same way, CRM teaches us to effectively *use available resources* in order to *increase situational awareness*. Both of these tools begin with a list of facts, and end with a picture of reality. When I use ORM and CRM (either consciously or unconsciously), the lights are illuminating the runway environment (figuratively speaking). The point is that even though the runway was there, I could not perceive it without the lights to show me that reality—common sense, right?

The above scenario illustrated a lack of perception, but a more dangerous situation exists with a faulty perception. A faulty perception may have lured us to land if, say, there had been a short, parallel runway with lights on. In either case, an understanding of perception and reality matters, because tools like ORM and CRM help us identify and organize the framework of facts called reality. Identifying facts is saying the same thing as accumulating knowledge. The bag of tricks is filling up. Accumulated knowledge is useless unless it is organized into a meaningful (and manageable) framework. Enter ORM and CRM. Even then, this organized knowledge is useless to others unless we distribute it. But the base of this triangle is dependent on the accuracy of our knowledge.

We don't have to reinvent the wheel to organize our knowledge base. One of the most readily available methods we have is the question/answer scenario already incorporated into ORM and CRM. This is best done during mission planning, but even in the heat of the moment I can say, "I am setting up for Air Refueling at night; what is going to try and kill me next? How am I preventing that from happening? Which of my available resources will I use if prevention doesn't work?"

In this way, we guide ourselves (and those with us) to perceive more, and more accurately, at the opportune time. We'll be ready to act when necessary and according to established procedure, or at least good judgment.

USAF Photo

Down To Earth Methods For Avoiding Ground Collisions

ANONYMOUS

It was a beautiful VMC day and the mishap crew just completed a highly successful seven-hour combat mission at a forward deployed location. The instrument approach and full-stop landing were all textbook and eye-watering, to say the least. The crew exited the runway onto the parallel taxiway and made their way back to the parking ramp. As the crew entered a right 90-degree turn into their assigned parking spot, a maintenance stand seemed to be pretty close to their right wing tip. They decided to continue the turn and monitor their taxi references. Suddenly, the crew felt a thud and heard a loud screech from the right side of the aircraft. The once-calm marshaller was now frantically giving them the signal to stop. After a few expletives, the crew shut down the aircraft, exited, and made their way to the right wing. The maintenance stand they thought *might* be a factor, sure enough was. The damage: a bent stand, a dinged-up wingtip, and a whole lot of lost pride.

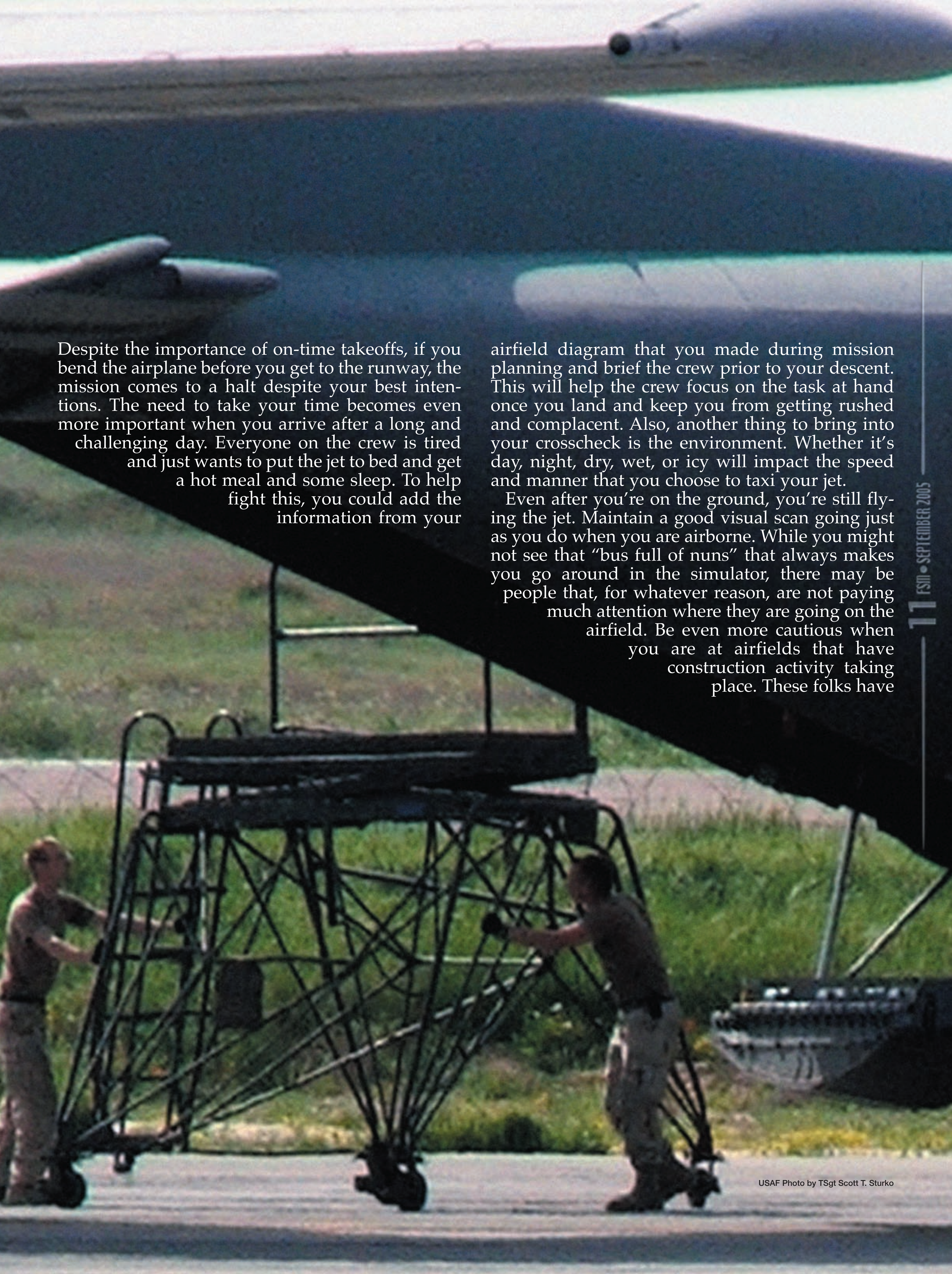
Luckily, this accident didn't really happen, but it easily could have. Many crews commonly find themselves in this situation. So, how did this crew avoid this mishap? Simple; they stopped the aircraft. After flashing the aircraft lights at the maintenance personnel, all parties understood the ill-positioned stand needed to move. As a result, no damage and no lost pride. However, some crews haven't been so fortunate. Over the past two years, the number of Class C ground collisions has been on the rise. Some are attributed to wildlife strikes and maintenance tow operations; however, this article will focus on the actions of the aircrew and how we can use simple and basic concepts to put a stop to this growing trend.

The first strategy we can employ is good, old-fashioned mission planning. This is particularly important when going to an unfamiliar airfield. Doing a thorough study of NOTAMS, ASRR, IFR Supp, etc., will alert you to, and mentally prepare you for, the obstacles and conditions of the airfield you will face while taxiing. It's also a good idea to put this info onto a copy of the airfield diagram. This way, when you land you will have a quick graphic reference handy in the cockpit to help guide you and keep you safe. This is also a good tool for other crewmembers to quickly reference to get them up to speed during their mission prep as well. Also, particularly for the newer crewmembers, take the time now during mission planning to review your taxi references. The last thing you want to do is to be approaching an obstacle and trying to remember which reference is which.

The next thing you can do is to slow down.

Despite the importance of on-time takeoffs, if you bend the airplane before you get to the runway, the mission comes to a halt despite your best intentions. The need to take your time becomes even more important when you arrive after a long and challenging day. Everyone on the crew is tired and just wants to put the jet to bed and get a hot meal and some sleep. To help fight this, you could add the information from your airfield diagram that you made during mission planning and brief the crew prior to your descent. This will help the crew focus on the task at hand once you land and keep you from getting rushed and complacent. Also, another thing to bring into your crosscheck is the environment. Whether it's day, night, dry, wet, or icy will impact the speed and manner that you choose to taxi your jet.

Even after you're on the ground, you're still flying the jet. Maintain a good visual scan going just as you do when you are airborne. While you might not see that "bus full of nuns" that always makes you go around in the simulator, there may be people that, for whatever reason, are not paying much attention where they are going on the airfield. Be even more cautious when you are at airfields that have construction activity taking place. These folks have



USAF Photo by TSgt Scott T. Sturko

Wing Tip Growth

Straight Wing

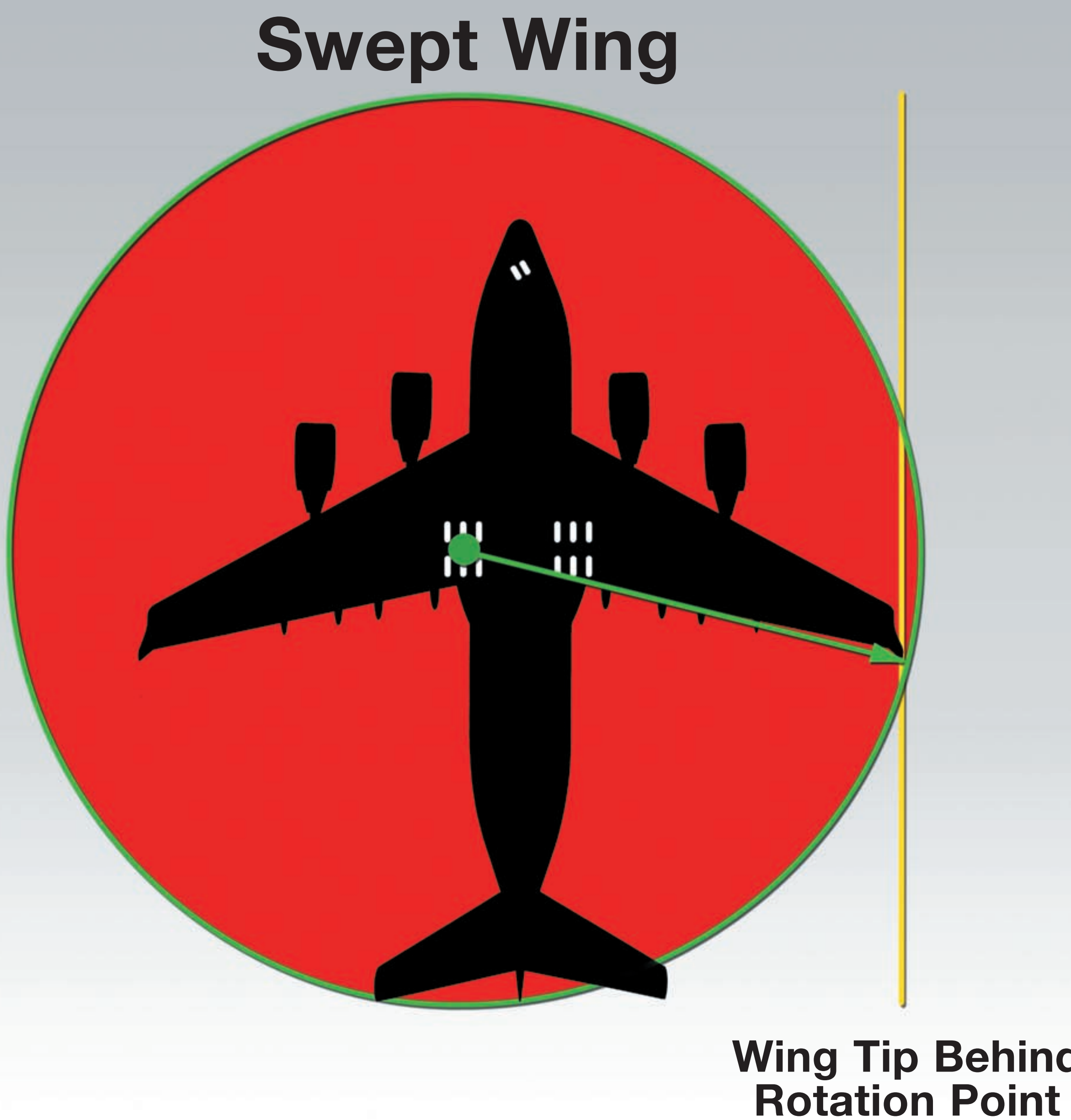
Wing Tip Abeam Rotation Point

Illustration by Dan Harman

minimal training on operating a vehicle in the airfield environment and chances are their focus is getting the job done quickly and keeping the foreman off their back, not on watching out for you.

As you are making your way to parking, remember to account for wing growth. Wing growth is a factor primarily for aircraft with large swept wingspans such as cargo, tanker, and bomber aircraft. On these aircraft the wingtip path extends past the straight-line path when it is in a turn. The amount that it extends beyond the straight-line path depends on the degree of turn and the degree of sweep on the wings. Remember this phenomenon, and account for it prior to making your turns.

Now that you have done all these things and something seems to still be obstructing your path and just doesn't look quite right, what can you do? The best thing to do is to stop. Stop and take time to evaluate the situation and come up with a solution. You should consider the following to ensure



your clearance: Put a crewmember in the door to get a better look so you are not relying solely on cockpit references, de-plane a crewmember, or request wing-walkers. All are much better options than to just think you will be OK and then continue. But if you are still in doubt, continue to hold your position. If you fail to utilize your crewmembers to assist in wingtip clearance or feel your visual cues are enough to avoid a ground mishap, your luck will eventually run out. No one will ever remember you were the guy that took a few extra minutes to taxi the jet onto the parking spot, but everyone will remember you were the one that hit the stand.

Ground collisions are on the rise in the Air Force. As operators, we can use sound mission planning, judgment, a little common sense, and patience to do our part in turning this trend around. Remember that the flight isn't over until the jet is buttoned up and the paperwork is done.

Be safe and keep the dirty side down.

USAF Photo by Jacob N. Bailey

The Hazardous Taxi

CAPT STEVE GRAHAM
13 FS
Misawa AB Japan

USAF Photo by SSgt Chad Chisholm

Minimizing risks while accomplishing the mission is an important part of our Air Force. We all know it as Operational Risk Management (ORM). I used to think of ORM as "common sense made complicated," or just another mandatory ground currency. I thought this way until I helped solve a hazardous taxi problem at Misawa Air Base. It was through this experience that I came to understand the importance of ORM and the six steps that make it work.

Taxiing back from a mission is not a hazard-free task. Imagine you are one of the world's greatest Wild Weasels taxiing back from yet another successful mission. Raging over the mach, you protected the strikers for the vul from multiple hostile aircraft and suppressed all factor surface-to-air missile threats. You made quick decisions in the air and accomplished the mission. The night visibility is poor due to low clouds and rain, but you bring the jet back with ease. Now that you are on the ground, you continue to stay vigilant. Your marshaller is directing you to turn to enter the throat of your hardened aircraft shelter (HAS). You turn and follow the marshaller's direction. While taxiing, you are clearing for obstructions, but you only see the marshaller's wands and the reflective paint of the taxi lines. You notice a piece of AGE equipment, and the crew chief's hit-and-run kit is close to your parking spot, but it's difficult to judge the exact distance. You continue on the taxi line and follow the marshaller. WHAM! The tip of your AIM-9 just struck the ladder you thought was a safe distance away from your jet. This hazard will not only cost the Air Force money, but you might lose your pilot wings.

All pilots know that it's ultimately their responsibility to bring back the jet on loan to them from the government. The airman who taxied you into a stationary structure will probably get remedial training, but you will bear the brunt of the incident. An instance similar to this almost happened at Misawa AB and highlighted the problem. The question was: How do we prevent this from happening in the future? The first ORM step is set into action: Identify the hazards.

The hazard in this instance was taxi operations when in close proximity to parking equipment. AFI 11-218, *Aircraft Operations and Movement on the Ground*, states:

1.22.3 Do not taxi aircraft closer than 10 feet to any obstacles. This restriction is waved under the following circumstances:

...1.22.3.3 Operating locally based aircraft from parking spots specifically designed for those aircraft… Support equipment required for each spot shall be placed in appropriately designated marked areas. A marshaller must be used.

During the incident, a marshaller was being used, and both the pilot and the marshaller were doing their best to follow the regulations while operating in poor conditions. The issue was handed to Standardization and Evaluation to find a solution and make it happen.

During the risk analysis, the second step in ORM, it was noted that there was a lack of references when entering HAS areas for obstacle clearance from support equipment. The lack of references led to the inability of both the pilot and the marshaller to adequately assess obstacle clearance distances. The exposure to this hazard happened every time a jet was parked. In the daytime it was easier to see that the jet would stay clear of an obstacle, but by how far? And what happened at night? The severity of the consequences for an aircraft hitting a stationary object is high in both loss to the Air Force and pilot. However, due to pilot experience and limited night flying, the probability of this happening again is relatively low. The bottom line is that the lack of references was an unnecessary risk that needed a remedy.

The task of analyzing risk controls, the third step in ORM, was needed. A plan was devised to add an extra white line that denoted a clearance distance from support equipment. The line would run the length of the HAS, on both sides, making a simple solution that both pilots and marshallers could understand. Ground support equipment would be behind the white line that would give five feet clearance distance from the crew chief's recovery equipment. If a pilot or marshaller saw equipment in front of these lines, taxi operations would cease until the obstacle was moved.

The risk control measures were made but they needed coordination and implementation. The proposal was coordinated through Safety, Airfield Operations, Civil Engineering, Maintenance, and finally Operations. Through the coordination process, more risks were exposed. Items such as insufficient grounding wire lengths and nosewheel stop lines were reasons that marshallers did not taxi aircraft to designated parking lines. Inclusion of these recommendations was added, and the final proposal was sent to both the maintenance and operation group commanders.

The final decision, the fourth step in the ORM process, was made at the group level, where the cost of the proposed risk control to the observed hazard was analyzed and found appropriate.

Implementation of the risk control, the fifth step in ORM, once again went back to coordination through Airfield Operations, Maintenance, and Civil Engineering. A detailed plan for the exact placement and size of the new safety line was disseminated. Questions were answered and time deconfliction allowed minimal impact to flight line operations. Within two weeks of getting the work order, civil engineering had painted new white lines on every HAS specified.

The lines were now in place, but what use were the lines to the pilots and marshaller without knowing what they represented? Without imparting the proper knowledge to the pilots and maintainers, the lines meant nothing. An FCIF was sent out to the pilots, detailing the use and value of the new white lines. Maintainers were informed through mandatory meetings.

After the new procedures were implemented, I saw that the marshallers made sure support equipment was behind the white lines. When I asked pilots about the new procedures, a majority of them knew the benefits of the lines and what to do if support equipment was in front of it. A review of the risk controls and procedures, the sixth step in ORM, was a success in the short term. More in-depth reviews and feedback will be needed in the future to ensure the continued success of the new white lines.

From the beginning of the risk assessment to the review of the risk controls, the taxi line process and the Misawa leadership taught me how ORM works. The systematic process sets up guidelines for how to handle problems that sometimes take more than common sense to solve. By following the six steps of ORM I was able to have the forward thinking to help reduce risk to pilots and to prevent taxi incidents involving support equipment from happening in the future.

How Well Do You

Know Your Airfield?

USAF Photos
Photo Illustration by Dan Harman

Motivating Safe Behavior

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"The slogan 'Safety First' has been around a long time and is probably the result of some long-forgotten safety manager's efforts to bring emphasis to the safety program" (*Aviation Safety Programs: A Management Handbook*, Richard H. Wood). Though it sounds good, and almost every Air Force squadron preaches it or pilots brief it before the crew steps, it's simply not true. Whatever it is we are doing, whether it be dropping bombs, engaging in air-to-air combat, or flying 18-hour reconnaissance missions, we have a primary objective for each mission, and I can guarantee you it's not to be safe. However, safety somehow needs to be instilled within our objectives. Ultimately, I think our leadership would like us to accomplish the primary mission or objective in full, and perform that mission as safely as possible.

From my standpoint, the best way to accomplish a mission safely is to both encourage and motivate not safety per se, but rather safe behavior. Promoting safety is something that needs to be embedded in an aviator's mind from the onset of training and continually refreshed through monthly safety meetings and safety training programs. Additionally, every aviator needs to be actively involved with either the unit or wing level safety office, if not both. This would include knowing what you can offer to them and, in return, what they can offer to you. Here are some questions for you to determine how familiar you are with your safety office.

Do you know what your safety office can do for you or why they are even in your squadron?

Do you know what kind of safety awards you are eligible for?

Do you have any idea how your squadron plans to help achieve the zero mishap rate goal?

Do you know what to do if air traffic control tells you over the radio that they are going to report you to the FAA? Have you ever heard of ASARS?

Are you familiar with BASH, MACA, or incident reporting? Do you know what they are?

If you can't answer these questions, you need to talk to your safety representative. If you are a safety representative, you need to educate your squadron at the next safety meeting rather than showing slides on how good your squadron/wing is doing in relation to the rest of the flying organizations, I

USAF Photos
Photo Illustration by Dan Harman

guarantee you that not everyone in your squadron knows why your office exists.

The best way to motivate safe behavior is through involvement. If everyone in your squadron were actively involved with the safety office, safety would become part of the squadron culture. Aviators would behave in a safe manner and influence others to do the same. More importantly, aviators would not feel reluctant to report or identify safety problem areas that may otherwise just be overlooked. Inherently, they would feel obligated to do the "right thing."

It is also imperative that the safety office not only coordinate, but also communicate regularly with both training flight and stan eval, in addition to wing safety. Through these programs you can trend problem areas that would ultimately break the mishap chain before one ever gets started. It should also be made clear to anyone in the squadron that "they" are the ones responsible for preventing mishaps. It should be embedded in the mind of every squadron member that they can report, without repercussion, anything that they feel is unsafe or something that could lead to an incident.

Over time, when people learn all about your safety program and people start to utilize your office in a manner other than a "hang-out," you can effectively motivate safe behavior.

On a more individualized concept, or when actually out performing the missions your squadron was designed for, utilize effective CRM and human factors to also help motivate safe behavior.

"A more precise definition of human factors is the study of the interaction between humans and their environment. By environment, we mean tools, equipment, instruments, systems and vehicles that they use in their job in addition to the physical environment of the job itself" (Wood, ibid.). In this "environment" one can then truly determine how they react to certain situations. Hopefully, then, one will recognize their weak spots and take the appropriate steps to correct them. If something is performed incorrectly, whether it is improper radio calls, checklist usage or even maintenance practices, there is no better time to identify a potential problem and talk to the individual about it right then and there. Here it can also be determined what the root cause of the error is and how it can be tied to the human factors definition. Though it is a little harder to determine on single-seat aircraft, it is still possible and should not be overlooked. A thorough debrief could help identify some problem areas. It is also crucial to bring the problem up with either the safety office or training flight to see if it has become a trend or a problem serious enough to provoke further investigation.

Just as important as identifying problem areas, are rewarding proper procedures. Outstanding safety practices should be talked about and forwarded to the safety office just as improper practices. Rewarding proper procedure is something that is far too often overlooked and needs to be changed. Any squadron commander would much rather reward aircrew members for following safety practices than punish or make examples of those who don't. As many know, punishment is not an effective tool for provoking safe behavior, and could also result in crewmembers not discussing safety malpractice when they normally would have.

In a nutshell, to motivate safe behavior, it takes total squadron involvement. The safety office needs management support and the crewmembers need the appropriate justification to become involved. No matter how good you think your safety office is, there is always room for improvement. No matter how well you think your squadron members understand the safety program, there are those who have no clue. Become involved, keep your unit involved, reward those who excel in utilizing the safety program, and over time you will have motivated safe behavior.

Learning to Say "No" and Mean It or ORM in the Warfighter's Arena

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Nancy Reagan asked us to just say it. Undoubtedly, many of us heard it more times than we liked from our parents while growing up. It's a word few like to hear, but more often than not, it's probably the first word that comes to mind when calling a tech help line at midnight as we're trying to get our printer back on line. It's really just two letters, but those two letters can mean the difference between undamaged and destroyed, between walking away unharmed and permanent injury, and ultimately between life and death. As you've probably already guessed, that word is "NO."

In the realm of Operational Risk Management, or ORM for those out there seeking that next great three-letter acronym, there are many ways to say no. There are also many appropriate times to say no, but for one reason or another, it goes unsaid—or worse yet, unheeded.

Culturally, it's just not the word to say—we've all heard of the proverbial "Yes Man," but who has ever heard of the "No Man?" No one wants to be the non-mission hacker or known as the "Don't-Go-To-Guy." Chalk that up to simple human nature. We have simply been trained, or trained ourselves, over time to be agreeable. "Yes" is a positive, feel-good word—hearing it makes people smile; saying it makes you the hero. "No" is a nasty, negative word—resulting in frowns and scowls; it means delay, defeat, failure. But when is "no" the right answer?

If you're taking the time to read this, you've most likely reveled in ORM: Fundamentals, possibly even ORM: Essentials for Leaders, and anxiously await the movie. But, for now, let's just take a quick stroll down rote-memory lane and refresh ourselves on the basics:

The 5 M Model

Think back, through the mists of time. What were those 5 Ms? Everyone should remember at least *Man* and *Machine*. We provide the man and our equipment is the machine—simple enough. Now, we have to operate somewhere. Here's where *Media* comes in—good weather, bad weather, daytime, nighttime, peacetime, combat; this is where the man and machine operate. Where these three Ms intersect is the *Mission*. What is it we are trying to accomplish? In CONUS, it's probably training. In the AOR, we're using man, machine and media to bring the fight to the enemy. As to the last M, what binds man, machine, media, and mission together is *Management*—the overarching concept that encompasses the other four Ms. We manage the man, the machine, and the media and bring them together to accomplish the mission. When we manage, we are ultimately trying to find the best fit of assets, for a given set of circumstances, to provide some benefit—tactically or strategically. But we are also trying to manage the risk in doing so, because the loss of the man or the machine results in mission failure.

OK, so, now you have a handle on the 5 Ms, but how do we use ORM to manage?

The ORM Process: Step by Step

- In Step 1, we *Identify the Hazard*. This means analyzing our mission, determining where the possible hazards might occur, and then tracing each hazard to its root cause.
- Step 2 of the process calls for us to *Assess the Risk*. How are we exposed to the hazard? If the hazard occurs, how severe are the consequences? What is the probability or likelihood that the hazard will occur? Answering these questions gives us a better look at the risk we may (or may not) be preparing to accept.
- Step 3 brings us to *Analyze Risk Control Measures*, where we develop options for controlling the risk, where we examine the effects of imposing those controls and we prioritize each risk control measure.
- Step 4, we *Make Control Decisions*, determining which controls best fit our situation and then decide on how best to handle the risks we have assessed.
- Step 5, *Implement Risk Controls*, brings us to implementing the risk control measures, establishing accountability for the controls and providing support to those who implement them.
- Step 6 brings us full circle to *Supervise and Review*, and we must assess the effect our control measures have had on managing our risk. Are we on target? Are we still at risk? If so, why?

By now you're saying, "Enough rehashing. How does this get us to saying 'no' and meaning it?" Bear with me just a bit longer, because here it comes…

The Control Options List

At the outset, I said that ORM gives us many ways to say "no." Now, saying "no" to your boss or flight lead sound a little strong, but we can use the process to cushion the blow and persuade the decision-maker to follow a path that helps us reduce or eliminate risk. If we've followed the steps correctly, ORM allows us to justifiably *Reject, Avoid, Delay, Transfer, Spread, Compensate, or Reduce* the risk we face. *Rejecting* the risk is saying "no" and having the reasons to back up our decision. *Avoiding* the risk helps us to change the course of events, perhaps we fly a different route or change the time of day. To *delay* the risk, we wait for the weather to pass or for more support to become available. We may opt to *transfer* the risk to another asset more capable or less susceptible to the risk we face. If we have like assets elsewhere, we may choose to *spread* the risk; the "don't put all your eggs in one basket" theory. We may be able to *compensate* for the risk by modifying our mission, machine, or media. Finally, we may be able to *reduce* the risk by using some facets of any or all the other control options. In each case, we are constantly trying to balance the possible cost against the expected benefit, and to hopefully more wisely apply our limited assets to guarantee a successful outcome. When your assessment of the risk leads you onto dangerous ground, without an increase in benefit—that's when it is time to say "no" and mean it. And integrity demands you to make it stick.

"No" is sometimes the right answer, but never the easy one. When our chance of success is diminished to the point that the loss we face is greater than the loss we have encountered, it's time to stand up and say "no." While combat brings its own set of inherent risks, we must still manage those increased risks because the expected benefit is that much greater. A sliding scale, if you will, but we still put the same assets, the same man, the same machine at risk any time we depart terra firma, peacetime or combat notwithstanding. It's not so much about "Safety First" or "Mission First, Safety Always" or any of the other catch phrases you may have heard. It's not about "high ops tempo," "doing more with less" or even "high demand, low density" assets as we've heard about so much lately. It *is* about doing what you need to do with what you have, to complete your mission *and* preserve the man and machine for the next time around. It makes strategic and tactical sense. It makes economic sense. It makes safety sense.

So, when the time comes to make the hard choice, to make or break the mission, are you going to be the one prepared and willing enough to say "no" and mean it? ⊘

USAF Photo

Emergency Management Lessons Learned

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It was the usual clear Nellis Red Flag day. Our eight-ship of F-15C Eagles was fragged for the standard Offensive Counter-Air (OCA) fighter sweep. The admin for the day had Cylon 1 with Fazer 1 flight, two four-ships, rendezvousing with Anker 11 and Anker 12 in the Caliente tanker track to receive 6000 pounds of gas each and then go fight.

I was Fazer 3, refueling second after Fazer 1 on Anker 12. Once I received my 6000 pounds offload and completed the post-tank checklist, I moved out to the left wing of Anker 12. Upon my arrival to the left wing, I rechecked the total fuel. In less than 60 seconds, my total fuel went from 16,000 pounds to 15,000 pounds. If the jet were in afterburner at 500 feet above the ground, that high fuel flow would make sense. However, at 25,000 feet in the tanker track, something was definitely wrong. At that very moment, I received a call from Fazer 1: "Fazer 3, you're venting fuel."

I fixated momentarily on the fuel gauge for the next few moments, and I watched the digits decrease fairly rapidly: 15,000…14,900…14,800…14,700. The next radio transmission came again from Fazer 1: "Fazer 3, check switches. You're venting from the centerline tank." The data from Fazer 1 was critical in determining where the fuel was venting, because I couldn't see it. I executed the "Uncommanded Fuel Venting" checklist. The first four steps are:

1. Fuel dump switch—NORM
2. External tank/conformal tank fuel control switches—STOP TRANSFER
3. Slipway switch—OPEN
4. Air source knob—OFF BELOW 18,000 FEET (BELOW 25,000 FEET IF SITUATION WARRANTS)

The only situational awareness I was receiving about the success of the first two steps of the checklist I heard from Fazer 1. He said it appeared the venting had simply slowed and not completely stopped. Another check of the fuel showed 13,900 pounds and still decreasing quickly. My next option was to descend quickly, and execute steps three and four of the checklist. The next words on the checklist page seem to provide little comfort:: "If fuel venting continues and flight to an emergency landing site requires more than feed tank fuel…"

"Fazer 3, the venting has stopped!" Finally, some good news transmitted from Fazer 1. It appeared all I needed to do was return home to fly a straight-in approach to Nellis using a slightly flatter than normal approach to account for the trapped gas in the external tank. I was a little upset that I would miss my first Red Flag sortie in four years; however, bringing the jet back safely was now my first priority. Fazer 1 and I determined that I would return-to-base (RTB) by myself without Fazer 4, so at least he could get some training. Hence, I returned back to Nellis single-ship to fly an uneventful straight-in for a full stop…or so I thought.

As I was the first one to RTB from the afternoon go, there was little air traffic delay. I contacted the Bullseye Supervisor of Flying (SOF), utilizing standard procedure to let him know I was returning early for trapped fuel and no assistance was necessary. I then contacted Red Flag Operations to pass the word that my jet was Code 3 for uncommanded fuel venting. My arrival thus far was uneventful until Nellis Approach handed me off to tower as I approached Craig Ranch for a straight-in to Runway 21 left.

I was completing frequent ops checks on my RTB just in case the fuel venting started again during my return. My attention was mainly focused on the fuel gauge, rotating through the wing tanks, to tank one, to the feed tanks and back to the centerline tank. If the venting started again, I was prepared to execute the next steps in the checklist.

Prior to the Craig Ranch checkpoint, I noticed my engine gauges were not giving similar indications. I typically look to see if one engine matches the other engine readings. The oil pressure gauges were not the same. Further investigation revealed the right oil pressure pegged at the maximum pressure of 100 pounds per square inch (psi). The high oil pressure malfunction can only be determined by looking at the oil pressure gauge. The Master Caution light only illuminates for low oil pressure. Therefore, thorough ops checks are the only way to catch the problem. I immediately executed the checklist for "Oil System Malfunction."

1. Throttle—IDLE. If oil pressure is below 8 psi or pegged at 100 psi, then
2. Throttle—OFF (conditions permitting)
3. Refer to AMAD FAILURE

Once reducing the throttle to idle, the oil pressure lowered to 85 psi, which is still above the maximum normal operating pressure of 80 psi. Therefore, there was not an immediate need to shut down the engine. However, the time to put this jet on the ground just got critical.

Once again, I contacted Bullseye SOF with an update, stating I would now be doing a single-engine straight-in approach with trapped gas. I made sure I emphasized the engine would be in idle due to the oil system malfunction.

After landing and de-arm, I shut down the right engine, then I taxied back to the chocks, informing the maintenance supervisor this Eagle would now be Code 3 for both uncommanded fuel venting and high oil pressure.

Learning Points

The F-15C Eagle I was flying that day was built 25 years ago. There are obvious maintenance issues when dealing with aging aircraft. The type of emergency situation management applied when the airplane was new cannot apply now. The situation that occurred on this fateful day could have had a different ending due to the multiple problems.

Reviewing the decisions made by both Fazer 1 and myself, I would have done three things differently:

- First, instead of analyzing the uncommanded fuel venting in the tanker track while flying westbound with no particular direction in mind, I would have turned immediately to the nearest runway.
- Next, I would have taken Fazer 4 back with me. His assistance may have been invaluable, as I was the only aircraft in the pattern returning first from the Flag mission. As it had occurred, there was no one available for chase.
- Lastly, I would have declared an emergency earlier. History shows that the more time available for emergency response, the better the assistance.

Are You Ef-A-Snu?

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I hope the title got your attention, because the first step in safety education is to engage an often disenchanted audience. Safety asks the listener to consider what no one expects to ever have happen and adjust their behavior to prevent it. When talking about safety issues, it isn't hard to relate to the flight attendant's pre-takeoff announcement:

Ladies and Gentlemen:

Welcome aboard XXX Airlines flight XXX.

Your safety and comfort is our number one goal.

Please be sure to store all your hand carried luggage in the overhead.

To fasten your seatbelt insert the metal tab into the buckle.

To release pull up on the buckle.

In an emergency oxygen masks will drop from the ceiling.

Put your mask on first before assisting others.

There are XX emergency exits onboard located XX, XX, and XXX.

Please locate the exit nearest you realizing it may be behind you.

Etc., etc., etc.

In an online poll of over 3200 airline customers, it was determined that one in three routinely listen to the safety demonstration, 25 percent seldom, if ever, take notice, and the remainder listen sometimes. Interestingly those who listened to the demonstration rarely stated importance of the message as their reason. Among the popular reasons for not listening were: odds of accident occurring, lack of interest even among the crew performing the demo, and the idea that frequent travelers "know the drill." Those who did give their attention shared that it was out of respect for the flight attendant, or because they had nothing better to do.

Many of the comments made by airline passengers ring true with aircrew during safety briefings given Air Force-wide. I know the drill:

- I can see this is not a truly important issue by the tone of the briefer.
- I pay attention because I have nothing better to do at this moment.
- It will never happen to me.
- Or, thank goodness, I don't have to give this brief.

So, how do we as Air Force fliers go about changing this tendency to dismiss safety as irrelevant?

I will ask you again, are you ef-a-snu? What's that, you ask? Just answer the question: are you ef-a-snu or not? How can you answer that question unless you know what I'm talking about?! Aha!

In safety, we tend to throw around concepts, but often our thoughts are vague and insubstantial. Without an objective definition, we can't begin to think intellectually (ref: Noah Weinberg, *48 Ways to Wisdom*). So, let's try this approach:

"Are you a safe pilot?"

"Of course I'm safe! What kind of an insulting question is that?"

"So, tell me, what is the definition of a safe pilot?"

If you really desire to be a safe pilot, you need more than feelings to determine whether you're attaining that goal or not. You'll need a clear way of measuring it. Otherwise, you can do whatever you feel like doing and paint yourself "safe." Even Evel Knievel presumably had a goal of "being safe"—but somewhere along the way, something

Photo Courtesy of Boeing

went wrong. Once you have a good definition of a safe pilot, you can more easily determine if your life is consistent with that definition.

Flying aircraft takes a certain amount of risk. Anyone who has flown for any length of time can tell you there are safe pilots and reckless ones. To determine which category you fit into, you must define your terms.

One way to help determine where you fall is the "I-You-He" game. This concept deals with the idea that when referring to ourselves, we paint the best possible picture in white. With others, we don't want to be insulting to their face so we paint them gray. Finally, when others are not around to defend themselves we paint them black. For example:

You're a crewmember in a jet flying 50 feet AGL down a winding mountain low-level route. As you grip your ejection handles in fear of your life, you turn to the pilot and say, "Aren't you being a bit foolhardy?"

"Me? Oh, no. I'm brave. I'm not afraid of anything!"

If you're lucky enough to live, you say, "That guy's a reckless idiot!"

The pilot refers to himself as "brave." To his face, you call him "foolhardy." To a third party, he's a "reckless idiot."

Which one is the reality?

By working through the definitions, we can assess the situation without emotions getting in the way:

Brave = Taking a necessary risk for a worthwhile purpose (e.g., rushing toward a burning aircraft to save a trapped crewmate).

Foolhardy = Taking an unnecessary risk, yet with a noble purpose (e.g., rushing toward a burning aircraft to save a crewmate, but without any protective gear).

Reckless Idiot = Taking an unnecessary risk for no worthwhile purpose (e.g., rushing toward a burning aircraft just to watch it burn).

Now, let's go back to our safe flying example. You turn to the pilot and say, "Why are we risking our lives? What is the worthwhile purpose?"

The pilot is now being asked to consider the possibility he is a reckless idiot. The point here is this: To honestly assess your personal safety while flying, you must have a clear definition of what safe flying actually means. Once you have established your definitions, you must use your intellect—not just your feelings—to place yourself somewhere on the "brave to reckless idiot" spectrum. Realizing the tendency to call ourselves "brave" and others "reckless" makes this a challenging task.

Finally, be willing to make the effort to be safe. It is one thing to desire to be safe, and quite another to exert the effort it takes when issues of safety present themselves. One of the best instruments we have and often fail to utilize to full advantage is the mind. In safety, we can either focus our minds on the lessons learned by those unfortunate fliers who preceded us, or we can dismiss those briefings and rely on personal experience.

To learn from others, we must train ourselves to listen better. Let's return to our flight attendant brief. The only way to gain anything from the demonstration is to train our minds to focus on the important issues being addressed. Listening is a skill, just like flying is a skill. Skills can be improved with practice. So, here are a few things to keep in mind during your next safety brief:

1. The ego in us wants to be heard; the wisdom in us listens.

2. Keep focused on the message; listen for facts, not feelings.

3. What is the key point?

4. Strive to listen, think and ponder at the same time, because your mind will work faster than the briefer can speak.

5. As you improve, try to anticipate what will be said before it occurs.

Once you have determined where you honestly fall in terms of safety, and once you begin training your mind to listen for the wisdom of others, only one thing remains to determine if you are ef-a-snu. As you strive to put into practice what you hear in future safety briefings, keep in mind what a sage once said, "If you see a wise person—a true intellectual—making a mistake someday, do not think badly of him the next day, because he has surely corrected his mistake."

So, the real question is: Are you ~~un~~safe*?

*(spelled backwards is ef-a-snu)

OPS TOPICS

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

Delivery issues. Here are some cases where an airdrop didn't quite go as planned. Are you ready for the unexpected and potential equipment or personnel errors during your drops?

Parachute Stuck Where?

A unit had two Container Delivery System (CDS) airdrop malfunctions. The first event was thought to be an anomaly, but after the second event in less than a week, this type of occurrence appears to be a notable hazard during high velocity CDS (HV-CDS) airdrops.

The first malfunction occurred on a mission flown as a local night TAC. The event crew (EC) planned HV-CDS and heavy equipment (HE) airdrops followed by enroute/ground ops (EGO) training. Neither the aircrew nor the drop zone (DZ) ground party saw anything unusual about either airdrop. The first indication of an airdrop malfunction occurred during post-flight walk-around when the aircraft commander (AC) noticed something, parachute material, stuck in the elevator (between the inboard edge and beavertail section). He reported no binding or other abnormalities with the flight controls. The joint airdrop inspection (JAI) loadmaster was notified and responded to investigate. Subsequently, the JAI loadmaster located the actual parachutes used on these airdrops and discovered the HV-CDS parachute with a large hole. This confirmed the parachute material in the elevator came from the CDS airdrop. Inspection of the aircraft revealed no damage to the inside of the cargo compartment or any other indication of a malfunction.

The second malfunction occurred during a local day TAC mission. The EC planned HV-CDS, HE, and training bundle personnel (TBP) airdrops. The HV-CDS airdrop was completed uneventfully. Neither the aircrew nor DZ ground party saw anything unusual about the airdrop. The AC noticed no binding or other abnormalities with the flight controls. After completing the airdrop, the EC returned to base to have maintenance check out a problem. While uploading the maintainer, the loadmaster noticed something stuck in the left elevator trim tab area. The engineer investigated and confirmed there was material stuck in the flight controls. The EC shut down and confirmed the material to be nylon parachute material. After notification of the second malfunction, the group commander halted all HV-CDS airdrops, pending further investigation. Both incidents were upchanneled to AMC tactics and stan/eval.

Both event parachutes were 26-foot HV ring-slot nylon type. No defects were noted, except for missing panels as a result of the events. All rigging and JAI were accomplished in accordance with technical order procedures. The event parachutes were packed by two different riggers. All remaining like parachutes were impounded for further inspection. Three randomly selected rigged parachutes were inspected and presented no discrepancies. Both left and right anchor cable stops were correctly positioned at FS 773. Weather conditions were not a factor. Upon inspecting both aircraft, skin/sheet metal structural defects were noted in the empennage area, which apparently contributed to the events. The skin on the tail of the first aircraft had a rough surface skin patch between the elevator and the beavertail which may have contributed to the parachute snagging on the tail.

On the second aircraft, the left elevator trim tab had skin separation at the left inboard forward corner. This separation measured 1/8" and allowed the chute to snag and tear a portion of the chute's panel away.

These minor defects on both aircraft were within maintenance inspection limits. In both instances, it is important to note that if the 550 chord in the parachute suspension lines had become entangled in the trim tab, elevator, or empennage, the end result could have been much worse.

Could this happen to you?

Boat Hits Aircraft

The C-130 crew was performing a combination airdrop of a 36-foot, US Navy special operations boat loaded on a 21-foot British airdrop platform. During the airdrop phase of the mission, the main deployment chutes deployed prematurely with the load still inside the aircraft. As the airdrop continued and the load was being extracted from the aircraft, the boat struck the aft portion of the aircraft.

The mission was fragged as a visual combination over water airdrop of a S.E.A.L. boat and personnel jumpers at a drop zone located off the coast. On the day prior to the flight, the platform was loaded on the aircraft with the center of balance at flight station 540. The airdrop load was inspected in accordance with the joint airdrop inspection report. An aircraft inspection was also performed by the loadmaster who inspected the airdrop load. During the inspection he noted the actuator arm on the extraction force transfer coupling (EFTC) was extended at a pronounced angle due to the height of the British platform that the boat was loaded on. The Navy personnel produced documentation on the certification of the system for airdrop. The preflight on the day of the mishap was accomplished without incident, and the loadmaster also conducted a routine inspection of the load and aircraft on the day of the mission.

All normal checks and procedures to conduct the flight were performed without incident. The aircraft departed the location and the crew entered the airdrop phase as lead aircraft of a two-ship visual formation and completed all required tactical checklists and warnings. As the formation proceeded to the drop zone, the crew was informed that the drop zone was not set up and the formation entered an orbit at the initial point (IP). After approximately 30 minutes, and after receiving confirmation that the drop zone was ready for operations, the crew resumed all normal airdrop procedures and began the run in to the drop zone.

During the extraction phase, the Nav called for the 'green light' and the co-pilot pushed the release button. The loadmaster heard the 'green light' call and observed the green light illuminate. The jumpers momentarily blocked his view of the extraction chute and he was not sure if it left the bomb rack. Therefore, he pulled the T-handle. The extraction chute deployed and began to inflate, and the aircraft decelerated slightly under the drag of the single 28-foot extraction chute. Unfortunately, the right-hand locks did not release the load. A momentary hesitation was observed before the load suddenly left the aircraft. Therefore, the loadmaster did not have a chance to pull the right-hand crossover. The extraction chute was observed to inflate normally and then begin to close just prior to the mishap portion of the airdrop sequence. The EFTC released, allowing the main cargo chutes to deploy with the boat still inside the aircraft. With the release of the EFTC, the normal deployment sequence began with the four G-11B cargo parachutes beginning to inflate. The main cargo chutes forcefully pulled the load out of the aircraft. The suspension lines attached to the aft end of the boat, which was orientated forward in the aircraft, began to pull vertically, lifting the boat up. In addition, the explosive squibs holding the boat on the platform fired, releasing the boat from the platform. The combination of the free boat and vertical lifting by the suspension lines resulted in the boat striking the cargo door, the starboard side of the aircraft, and the beavertail section of the tail. The five jumpers then exited the aircraft.

During the post-drop cleanup, the loadmaster notified the pilot of the impact and subsequent damage. The aircraft entered a holding orbit and completed the post-drop checklist, inspected for damage, and conducted a thorough operational risk management (ORM) assessment. The crew concluded that the damage did not adversely impact the controllability of the aircraft. A normal straight-in approach was flown to a safe landing. Post-flight maintenance inspection of the dual rail system found lock No. 7 to be out of tolerance; this was adjusted. Although significant, the failure of the lock should not have released the EFTC. The aircraft is capable of towing a single 28-foot extraction chute, and emergency procedures exist for such an event. The EFTC was recovered and found not to be damaged at the coupling. However, there was a slight bend in the actuator cable, which could have been caused during the deployment phase.

What are your procedures for non-standard loads and when plans go astray? Do you know what the procedures are for just this type of emergency or malfunction? Another topic for safety day!

Maintenance Matters

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

The following incidents reflect maintainers and weapons loaders who got too close to the aircraft with their support equipment. We operate in a constantly moving environment, so make sure the moving parts don't hit the stationary objects.

The Loader Who Came Too Close

The mishap load crew (MLC) was performing weapons load training (WLT) involving an inert GBU-28 to be installed on the centerline pylon station of an F-15E. Two evaluators were present to complete a weapons re-certification load for the mishap crew leader (MCL) and mishap loader driver (MLD). The MLC completed the "safe for maintenance" job guide and munitions preparation on the aircraft prior to the munitions loading, with no discrepancies noted. The MLD was raising the GBU-28 up to the bomb rack unit located on the centerline pylon with an MHU-83 jammer. Both the MCL and the mishap crew technician (MCT) conducted a visual inspection for alignment and clearance between the aircraft and the GBU-28 prior to the MLD proceeding with the upload. The munition appeared to "jump" as it seated into the BRU-47 bomb rack. The right middle side of the MHU-83 jammer table then struck the left main landing gear aft door. The mishap evaluator observed the jammer table strike the landing gear door and instructed the MCL to inspect it for damage. Once the damage to the landing gear door was verified, the WLT was terminated, the GBU-28 was secured back onto a weapons trailer, and the aircraft was impounded.

Although the MCL and MCT visually confirmed alignment and clearance, the lugs of the GBU-28 and the hooks of the BRU-47 were slightly misaligned prior to the MLD raising the jammer table. This misalignment combined with the pressure exerted by using the jammer controls to raise the jammer table caused the munition to "jump" as it seated into the bomb rack. The jammer table struck the left main landing gear aft door, causing the corner to bend outward, and the forward bottom corner of the door was bent up into the main structural part of the door. Sheet metal evaluated the door as not repairable due to the extent of damage.

Tech order guidance was a factor because T.O. 1 F-15E-33-1-2 provides an alternate configuration for the MHU-83 fork adapter when loading the GBU-28, which allows for the fork adapters to be inverted, due to the limited clearance between the aircraft and munition. However, a weapons standardization policy letter prohibits the use of this alternate configuration due to the increased possibility of damaging a fork adapter during loading operations. In neither publication is the use of the sub-control panel specifically required for GBU-

28 or other space-limited weapon load operations. Using the alternate configuration for the fork adapters and utilizing the sub-control panel would have prevented this mishap. Another case where attention to detail and trying to prevent a mishap may have led to a mishap.

Have you looked at your local procedures lately to determine if they still apply or could lead to other damage?

I Don't See Any Damage

Two crew chiefs, worker one (W1) and worker two (W2), were tasked to recover and perform a park-after-flight inspection on the aircraft following a normal training sortie. The aircraft taxied to the final parking location and was marshaled into position. The aircrew accomplished a post-flight walk-around inspection of the aircraft, but did not notice anything unusual. W1 and W2 began to accomplish the park-after-flight inspection. While inspecting the aircraft exterior surfaces, W2 discovered a dent in the forward leading edge of the No. 5 engine nose cowling. The dent was approximately one-and-one-half inches in diameter and one-half inch deep. Structural maintenance evaluated the dent and determined the dent was out of tech order limits.

The actual cause of the mishap could not be determined, for there were no witnesses to the incident. The most probable cause of the damage was from an impact with a B-4 or B-5 maintenance stand. Based on the maintenance activity accomplished on the aircraft in the three days prior to the sortie, the engine inlets were inspected during the preflight and park-after-flight inspections. The engine inlets are normally inspected utilizing a B-4 or B-5 maintenance stand, and the damage probably occurred at some point during these inspections when a stand impacted the engine nose cowling without the individual(s) knowledge. Interviews with the crew chiefs who accomplished the preflight and park-after-flight inspections, a thorough review of the core automated system (cams) database and aircraft forms showed no specific maintenance activity to the No. 5 engine other than the preflight and park-after-flight inspections.

If you damage an aircraft, let someone know. An alert aircraft maintainer should have known they hit the aircraft and reported the damage.

We are only as good as we make ourselves.

I Thought You Did It

A supervisor (S1) and worker (W1) were installing a surge duct on a C-17A No. 4 engine, and to perform this task, S1 and W1 were using a split deck maintenance stand (SDMS). During the maintenance procedure, W1 climbed down the ladder of the SDMS and walked to the power panel located at the front right side of the SDMS and turned the battery switch to "on." W1 stated that as she descended the ladder of the SDMS, she remembers closing the personnel gate. After turning the battery power on, W1 walked to the back of the SDMS near the ladder and told S1 he could raise the SDMS. S1 was positioned inside and underneath the left engine door of the MA near the surge duct. S1 then used the remote control switch of the SDMS to raise the SDMS approximately two inches. While S1 was raising the SDMS, a loud bang was heard, S1 stopped raising the SDMS and both S1 and W1 saw that the personnel gate of the SDMS had contacted the core thrust reverser. Sometime between W1 climbing down the ladder of the SDMS and S1 raising the SDMS, the personnel gate swung open at a 90 degree angle, which positioned it beneath the No. 4 engine core thrust reverser. Once S1 started to raise the SDMS, the door stop contacted the outer edge of the core thrust reverser at the six o'clock position, causing a crack approximately 5/8" long.

A local check list (LCL) was developed by a team of subject matter experts (FTD instructor, QA and propulsion mechanics) to prevent incidents of the SDMS contacting the aircraft. The checklist is laminated and attached to the control panel on top of the stand. Under the input conditions section of the checklist there is a note that states "all input conditions apply to any movement/adjustment of the split deck/UMS." Under the personnel required section, it states three specialists are required—a supervisor/operator and two spotters. Under the safety section there is a note that states: "Use extreme caution when operating this piece of equipment in close proximity to objects." Also under the safety section, it goes on to say that a "minimum of two spotters" are required when the maintenance platform is driven, lifted, extended or maneuvered within 10 feet of aircraft, equipment, buildings or personnel. Under the safety section it also states: "Do not operate without the personnel gate closed and latched."

An inspection of the latching mechanism of the personnel gate revealed that the latch may not engage if the door is not completely closed; however, if the gate is completely closed, the latch does engage. IAW the LCL, part of the operator's responsibility is to ensure the personnel gate is closed and latched before operating the stand.

Where do think this crew went wrong? Was it crew size, operator error or just inattention to detail and published instructions?

USAF CLASS A FLIGHT MISHAPS

FY05 Flight Mishaps
(Oct 04-Aug 05)

30 Class A Mishaps
12 Fatalities
11 Aircraft Destroyed

FY04 Flight Mishaps
(Oct 03-Aug 04)

24 Class A Mishaps
13 Fatalities
11 Aircraft Destroyed

03 Oct	A C-5B sustained damage to 2 engines after multiple bird strikes.
04 Oct	Two F-15Cs collided in midair; both returned to base safely.
13 Oct ✶	An MQ-1L experienced damage from a hard landing.
18 Oct	An F-16 tire tread separated on takeoff; barrier engaged and gear collapsed.
20 Oct ✈	An HH-60G crashed during a rescue mission; 1 fatality and 5 injuries.
27 Oct	A KC-10 experienced a No. 3 engine failure in-flight.
24 Nov ✶	An MQ-1L crashed during an FCF.
30 Nov	A B-1B had an in-flight fire in the aft equipment bay.
09 Dec	An HH-60G experienced a hard landing.
14 Dec ✶	A B-1B nose gear collasped after landing.
20 Dec ✈	An F/A-22 crashed immediately after takeoff.
29 Dec ✈	An MC-130H impacted a hole in the runway on landing and was destroyed.
05 Jan	A C-17's right MLG strut failed on landing.
14 Jan ✶	A UAV lost its satellite link and crashed.
18 Jan ✈	A T-37B collided with a civilian aircraft; crew ejected safely, 1 civilian fatality.
22 Feb	An E-4B experienced a bird strike to the No. 2 engine.
10 Mar	A C-17 experienced a bird strike to the radome and No. 3 engine.
18 Mar ✈	An F-16D crashed short of the approach runway; pilot ejected safely.
22 Mar	A B-1B had an engine compressor stall, resulting in HPT/LPT damage.
25 Mar ✈	An F-15C crashed during a BFM mission; pilot ejected safely.
27 Mar ✶	An RPV was destoyed by an engine oil fire.
30 Mar ✶	An RPV crashed after propeller failure.

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31 Mar	✈	An MC-130H crashed during a training mission; 9 fatalities.
05 Apr		A B-52H experienced a lightning strike to the radome resulting in a fire.
07 Apr	✶	A sheet metal technician fell from an F-15C and was fatally injured.
13 Apr	✶	An F-15C injested a comm cord into the No. 1 engine; FOD damage.
18 Apr	✈	An F-16D crashed after engine failure; crew ejected safely.
28 Apr		A C-17 experienced a wing fire in-flight.
05 May		A C-17's No. 4 engine failed in-flight.
11 May	✈	An HH-60G crashed during a training mission; 1 fatality.
14 May	✶	An Aerostat broke its tether during a lightning storm and was damaged.
15 May	✶	A KC-135R experienced clear air turbulence; several severe injuries.
30 May	✶	A foreign aircraft crashed with USAF crewmembers on-board; 4 fatalities.
31 May		An F-16 was damaged after an aborted takeoff and barrier engagement.
06 Jun		A C-17A experienced a hard landing with underside damage to the fuselage.
08 Jun	✶	An MQ-1L departed the prepared surface and was damaged.
22 Jun	✈	A U-2 crashed on approach: 1 fatality.
28 Jun	✈	An F-16C was destroyed on landing; pilot ejected safely.
03 Jul		An HH-60G had a hard landing due to rotor decay.
08 Jul		The main rotor on an HH-60G contacted the intermediate gearbox and tail rotor driveshaft.
05 Aug		A C-17A departed the runway during landing.

Editor's Note: 22 Mar mishap was upgraded to Class A; 12 May, 24 May and 31 May mishaps were downgraded to 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 Aug 05**.


Seeing, still a big part of believing.