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Whether to for Weather

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contents

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You can't fool mother nature…

but she can make a fool out of you if you don't plan, prepare, or know when to knock it off. The articles in this month's issue deal with weather situations from training to combat, from mission planning to egress, from ORM to oh-no! There is a theme however; a little knowledge, preparation and common sense can keep you from re-learning these lessons the hard way. In other words, learn from someone else's mistakes. Please.

Here is a sampling:

"The ORM number was starting to climb just a little bit." (See page 4.)

"JSRC, this is Gecko12. We are down, with a hard landing. I say again, JSRC, this is Gecko 12. We are down, hard landing, our position is…" (See page 7.)

"…contending with freezing rain at my destination, severe turbulence at my first two alternates, and inoperative engine anti-ice…" (See page 10.)

"It was around 25 degrees below zero, with the wind chill making it about 10 degrees cooler…I had never really been exposed to this type of cold before this night, for any time." (See page 14.)

"I remember saying to myself we would never fly in this stuff…Two of four cops from the fire team were on their knees, vomiting in the snow. They knew we had come close to buying the farm." (See page 24.)

"This is where the 'fun' began. The airplane began to slide to the right, just like a car on ice." (See page 30.)

Finally, the compendium of knowledge from "Pilot Proverbs" is a particularly enlightening and entertaining read. (See page 18.)

I hope you learn and enjoy.

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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A Long Day In December

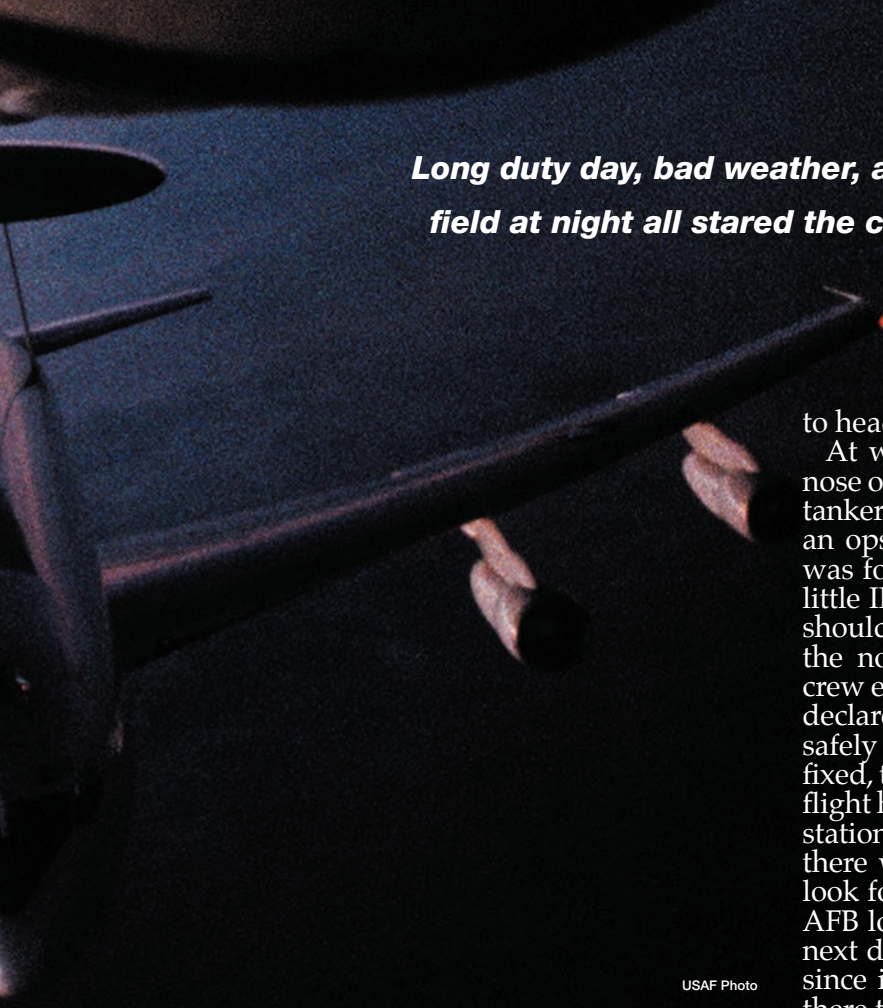
ANONYMOUS

We all know that mission planning is crucial to a successful mission. Sometimes, aviators don't have the opportunity to accomplish all the planning they feel is necessary for a particular mission, or certain factors are ignored. When this is the case, a crew can use other resources to complete the mission—for example Crew Resource Management and Operational Risk Management. CRM and ORM play a significant part in mission success, especially when all mission planning factors are not taken seriously.

Let me give you an example from my experience. It all started about three weeks before the mission happened. The crew (three pilots, two navigators, and two flight engineers) started planning to transport an E-3 over the Pacific Ocean for a tail-swap. The mission was simple: Get the plane to Tinker, then pick up a new aircraft and bring it back to Kadena AB, Japan. Everything was looking pretty good for the way to Tinker. The crew had two tankers, which would provide plenty of gas to get to Oklahoma with the jet stream at their backs. It would be about a 15-hour flight. Since the crew was augmented, they had a 24-hour crew duty day. The problem the crew noticed was for the return leg the next week. Without enough tanker support, the crew needed to do an ops stop in Alaska the second week in December. The crew brought up this fact to leadership, stating the weather would most likely be bad in Alaska. Were there any other options to get across the Pacific?

As the mission came closer, the crew continued to look at weather for Alaska and Oklahoma. Just for kicks, they also looked at weather for Hawaii. About a week out from the start of the mission, the crew wanted to see if they could get tanker support through Hawaii instead of Alaska for the return leg. The weather for the leg to Tinker was forecast to be great, but Alaska was supposed to see numerous snowstorms during the time of the return leg back to Kadena. (By the way, the weather for Hawaii was forecast to be great.) The crew brought up all this information to leadership before the start of the mission. They stated that flying into an unfamiliar field is a lot easier to do when the weather is VMC versus IMC. Leadership agreed with the crew, but there were other factors to consider: There is an E-3 squadron in Alaska with maintenance. Also, there is the cost of putting up the crew in Alaska versus Hawaii.

When the day of the mission came, the crew held a solid plan to get the aircraft to Tinker. The weather looked good for the whole route of flight. All the divert bases, missed air refueling bases, and tanker bases were forecast VMC, and were supposed to stay that way for the next day or so. The AR tracks were also forecast VMC, and since both air refuelings would be at night, the crew was very happy about this. ORM was looking really good for this flight. The crew launched for Tinker, but they didn't have a good plan to get the new aircraft back to Kadena.



Long duty day, bad weather, and an unfamiliar field at night all stared the crew in the face.

USAF Photo

As the crew headed across the Pacific, they continued to get weather information about the second AR. The weather forecast the crew received a couple hours earlier was wrong. A front had started moving in along western Alaska and the northwest U.S. The crew looked at their number-one missed AR divert, Elmendorf AFB. They were calling 100-foot ceilings, with no visibility. If the crew missed the second AR, they were headed to Eielson AFB. The second tanker was late due to weather, and took off despite knowing they were going to have to divert. The E-3 crew was thankful to the tanker crew because they now had the gas to make it to Tinker. They had dodged a bullet—they didn't want to go into Eielson for fear of not getting out of there for at least a couple of days.

When the crew arrived at Tinker, the first part of the mission was complete. Two of the three pilots had simulator training to do all week, along with one of the flight engineers. The other pilot started looking at weather and tankers for the return trip to Kadena. The crew talked with leadership back at home station, letting them know about the weather in Alaska and the northwest U.S. By the way, the weather was supposed to be bad for the next two weeks. Again, go figure; it's Alaska in December. All week, the weather forecast only got worse. The crew stressed how they would like to get tanker support through Hawaii. For the other reasons mentioned before, the leadership wanted the crew to head up north. How is the ORM looking now?

At week's end, the crew was ready to point the nose of the new aircraft toward the west. They had a tanker scheduled over the northwest U.S., and then an ops stop overnight in Elmendorf. The weather was forecast to be all right for the route of flight; a little IMC at Elmendorf for land time, but visibility should be fine. The crew took off and started toward the northwest. About 15 minutes into flight, the crew experienced a flight-control malfunction. They declared the in-flight emergency (IFE) and landed safely back at Tinker. Once the malfunction was fixed, the aircraft would be ready the next day for the flight home. Of course, the crew called back to home station and notified leadership of the setback. Since there wasn't a tanker available, the crew began to look for ops-stop options on the West Coast. Travis AFB looked like the best choice for an ops-stop the next day. It gave the crew some additional options, since it was approximately a five-hour flight from there to either Alaska or Hawaii. The ORM number was starting to climb just a little bit.

The next day, the crew showed for a second attempt for a flight home. The plan that day was to leave Tinker for Travis. After an ops-stop at Travis, the crew would then fly to Elmendorf to spend the night. The crew hoped home station could work the two tankers needed to get back across the Pacific from Alaska. The weather for Travis was forecast to be VMC, but Elmendorf was going to be 2,500-foot ceiling with about four miles visibility. Not bad, but the crew had to accomplish an ops-stop first. ORM was still climbing, but the experienced crew was aware, and felt they could mitigate the risk with good CRM.

The crew stepped to the aircraft ready to start back to the west. They had a few minor malfunctions during preflight. After the problems were fixed, the crew took off for Travis. The flight to Travis was uneventful. Then the fun began. On the ground, the crew found out the aircraft had a hydraulic leak. OK, the crew had a 24-hour duty day, and they were only six hours into it. The fix on the aircraft was going to be approximately four hours, so, the crew decided to press. They again looked at the weather for Elmendorf. The weather looked OK, but a front was supposed to pass through later, about four hours after the crew was scheduled to arrive. The crew made all appropriate plans with Elmendorf. The E-3 maintenance requested that the crew not land before 11 p.m. local. The crew looked at duty day, weather, and all factors that would keep them from being able to complete the

USAF Photo by TSgt Scott Reed

mission. All was good. The crew talked about how they would be landing at an unfamiliar field with marginal weather at night, about 18 hours into their crew duty day. ORM was still climbing, but the crew decided it was still manageable.

It was now about 12 hours into the crew's duty day, and they were leaving Travis for Elmendorf. The weather was good along the route of flight. Since there were three pilots, they took turns sleeping; just trying to mitigate the risk of fatigue. The plan was to have the IP land, with the experienced aircraft commander (AC) in the right seat. Both pilots were qualified to fly an approach to minimums. Plus, it was snowing at the destination, so the taxiways would be slick. The crew just kept mitigating the risk that was being put in front of them. They felt they were taking the necessary actions to lower the ORM number, which had been climbing all day.

About an hour out from Elmendorf, the crew called to get a weather update at their destination. The crew was happy to hear current conditions and forecast weather was 2,500-foot ceiling, four miles visibility, and light snow. The crew talked about flying an approach at night with snow falling. The approach and missed approach was briefed by the IP, because he was flying the approach and landing. He made sure the crew knew about the visual illusions and other problems that occur during a snowstorm. All crewmembers knew what was expected of them for this approach.

Just before descent into the field, the crew checked ATIS, and the weather was being called the same as forecast. The crew entered the weather at 11,000 feet, expecting to break out of the IMC around 2,500 feet. The descent was a little rushed and the crew was cleared for the approach. Despite the rush on descent, the crew established themselves on an ILS final. The approach was flown down to minimums. Cues were called by the pilot-not-flying at Decision Height (DH). The crew felt the aircraft was not in a safe position to land, so the go-around was called. The crew then executed the go-around following the climbout instructions. Immediately, the aircraft was back into IMC. On downwind, the pilot in the right seat took the aircraft so the IP could brief the second approach. After the brief, the IP took back control of the aircraft. When he had some difficulties with aircraft control, the pilot-not-flying asked for the aircraft. The IP kept flying until just before base leg, when he lost his HSI and CDI. The pilot-not-flying asked for the aircraft again, and this time the IP gave him control of the aircraft. Once established on ILS final again, the IP stated that the pilot in the right seat would continue flying the approach and landing. The IP's instruments started working again on final.

The second approach was flown down to minimums again. This time, cues were 12 o'clock at DH. The pilot flying stated "continuing," and at 100 feet saw the landing environment. He stated, "Landing crew." The crew safely landed in a very heavy snowstorm. The flight engineer asked where the 2,500-foot ceiling went. The crew then taxied in very carefully, glad to be on the ground. With the aircraft parked, the crew discussed the disappointment with the weather that had been called on ATIS. They also discussed how they used good CRM to mitigate the risk caused by the weather. Despite that the IP's instruments started working again, it had been the right choice for the AC to fly the approach and put the aircraft safely on the ground.

Then it was time to start planning to leave Elmendorf. The crew was now about 21 hours into their 24-hour duty day. They didn't have time to plan for a flight the next day. Plus, with min turn time, they would be taking off at night. No one on the crew had seen the mountains that were around the airfield. The crew told leadership back home that they were not going to fly the next day. Plus, they didn't have the tanker support to cross the Pacific. because there are no viable ops stop bases for the E-3 between Alaska and Japan. The crew wanted a solid plan before they left Elmendorf.

Three days later, after the snow stopped, they launched for Kadena with tanker support and a solid plan. During this mission, the crew used strong CRM to mitigate the rising ORM number. They talked about the different factors that caused risk. Long duty day, bad weather, and an unfamiliar field at night all stared the crew in the face. They were aware that the deck was stacked against them, but with effective CRM they were able to mitigate the risk and successfully complete the mission.

A Snowy Mountain In Afghanistan

CAPT CHARLIE SZAR
41 RQS
Moody AFB GA

USAF Photos
Photo Illustration by Dan Harman

(As told to Maj Robert J. Gendreau, HQ ACC/SEF, Langley AFB VA)

"Gecko 12, 11 is inadvertent IMC. Execute mountainous lost wingman, heading 240, airspeed 100 knots, MSA 13,000."

"Gecko 12, roger."

(Meanwhile … aboard Gecko 12)

"I've got zero vis on the right."

"We're good left, left turn."

"Clear left."

"Watch the rate of descent!"

"What's bucket airspeed?"

"72 knots."

"Roger, 72 knots."

"Check airspeed."

"Still 72 knots."

"Watch that ridge!"

"Roger, got the ridge."

"Ridge clear, 34 feet."

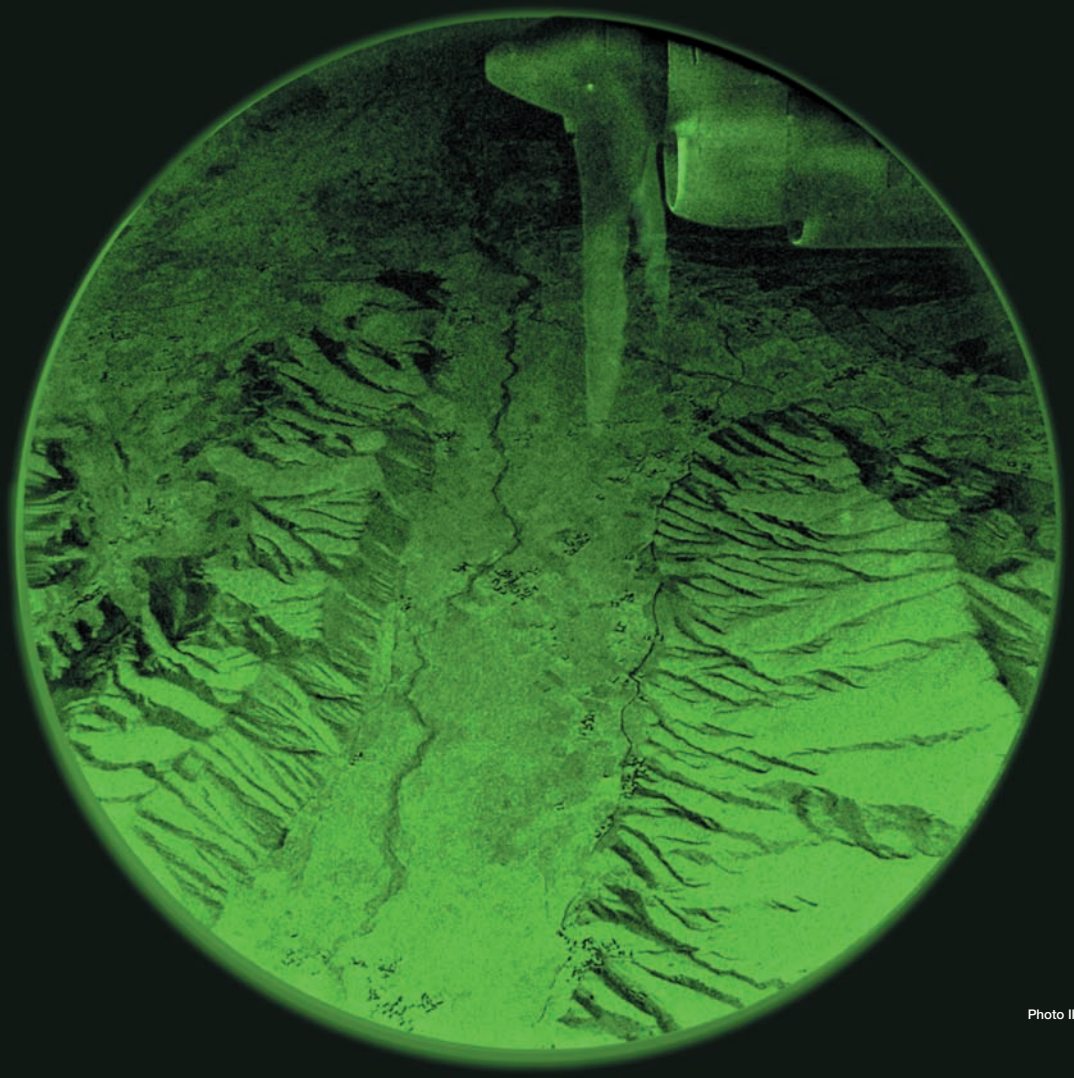
Impact.

"JSRC, this is Gecko 12. We are down, with a hard landing. I say again, JSRC, this is Gecko 12. We are down, hard landing, our position is …"

SEVEN HOURS EARLIER:

Our two-ship was scrambled from a fixed operating base (FOB) in southern Afghanistan to recover an injured Afghan Military Force (AMF) member with a gunshot wound. We departed the FOB about an hour after sunset, and secured the survivor near the Afghan/Pakistani border. We were directed north to another Fire Base to transload him. While in the Forward Area Refueling/Rearming Point (FARP) after the transfer, we were refining our return flight plan when our SATCOM radio came alive: "Gecko 11 flight, stand by for 9-Line." We hoped the next survivor was south of us, as the visibility was getting worse due to heavy snow. "Gecko 11 flight, proceed to the following coordinates to recover an injured Special Forces soldier with a fractured pelvis and back."

We completed hasty planning in the FARP and confirmed our fuel required and routing. VFR direct was not going to happen; the Hindu Kush, with 16,000 MSL peaks, prevented this. The MSL for our route ranged from 5,500 to 9,000. We did all the right things—updated weather and intel, and departed to the west. The snowfall had picked up and the visibility had dropped to around 1.5 miles with zero percent illumination. As we proceeded to the west, the terrain became more rugged and unforgiving. Increasing snowfall required us to alter the route twice. The weather was deteriorating rapidly. We continued to pick our way through the valleys using the FLIR at times to ensure visual contact with the terrain, as our Night Vision Goggles (NVGs) were becoming ineffective. It was obvious we had out-flown our visibility and our options were rapidly running out...



USAF Photos
Photo Illustration by Dan Harman

POST IMPACT

"Gecko 12, confirm you're down."

"Gecko 12 is down due to weather. We will advise our aircraft status...JSRC, this is Gecko 12. We have vehicle headlights approaching. Request CAS immediately."

After confirming there was no damage to the aircraft, we twice attempted to take off. The visibility was now close to zero-zero, and the reality of being stuck on an Afghan mountaintop was setting in fast. Rather than risk a takeoff in those conditions, we established a defensive posture and reviewed our escape and evasion route, if push came to shove. Although it was a hectic time, our familiarity with each other made this a much easier task to perform.

Bottom line: What happened, and how did we get there? Looking back on that night, there were no new lessons learned; rather, we had made the same mistakes as others in the past. Sitting on the ground in an unsecured part of Afghanistan for eight hours allows a lot of time to think.

Our initial route planning for the second mission was hasty but sound, taking into account ORM, Intel, weather, and supervision inputs from our Tactical Operations Center (TOC). Flight Lead's aircraft had higher Engine Torque Factors than our aircraft, resulting in more power for them. However, Lead did a great job of wingman consideration by keeping the airspeed down. Having flown four hours on NVGs already, we were used to the low illumination and visibility. This was also our third NVG mission in four days. We were proficient.

Entering the last valley, both aircraft were committed. The valley was very narrow, and our 200-foot AGL altitude was 9,000 feet MSL. The ridges on either side of the valley were obscured by clouds and low-lying scud. It would be difficult, if not impossible, to reverse course. However, seeing that Lead was about to enter IMC conditions, and knowing we didn't have the power to climb any higher, we had no choice but to turn. As we entered a steep left bank to avoid terrain, we started an uncontrollable rate of descent. A few things worked against us in the turn:

1. Overbank—we all know the deal on that!
2. Being on the leeward side of the ridge, along with our close proximity to it, the increased

turbulence didn't help us, either.

3. Katabatic (downhill) winds also increased our descent rate.

4. The last thing thrown into the mix was the increased torque required for a left bank!

What worked for us was exceptional CRM. Although we were in an uncontrolled descent, critical information was exchanged clearly and concisely. Our hard crews and previous spin-up, as well as our previous missions together, had definitely paid off. At multiple times during the descent, we had to pull maximum torque available to avoid crashing into the ridge, which caused significant rotor droop. The pilot-not-flying (PNF) had secured the No. 2 engine throttle (our weak engine) and before impact, advanced the throttle to Digital Electronic Control (DEC) lockout, taking manual control of No. 2 engine power. Had he not recognized this was truly our last chance of survival, this article might never have been written. During our spin-up training, we had the opportunity to perform a simulator flight and discussed similar scenarios. By going to DEC lockout that night, the PNF saved the crew and aircraft!

TRUTHS

The events on this mission confirmed these known truths:

1. Flying VMC in IMC conditions doesn't work for long.

2. Out-flying your visibility is never a good idea.

Pressing too hard leads us to the bottom line...why did both aircraft return to the FOB in one piece, albeit one was 9.5 hours late?

3. Quality spin-up training is worth the effort.

4. There is no acceptable substitute for individual proficiency. A crew is only as effective as the weakest crewmember.

5. Avoid staying in your comfort zone—basic instrument flying is critical to safe operations, brownout/whiteout takeoffs and landings, as well as in a successful transition to inadvertent IMC conditions. If you can't fly IMC when you're planning on it, there is no hope to do it if you "punch in." Additionally, both crews had one front-ender who had flown in icing conditions on a frequent basis.

6. Quality home-station training with increased emphasis on detailed, deliberate mission execution allowed us to perform hasty tasks and adapt to changes without a problem or second thought.

7. Take advantage of any mountain flying you can get! We did extensive spin-up flights in the mountains. Additionally, our unit sent an IP to the High Altitude Army Aviation Training Site (HAATS). He was able to teach us a few new mountain flying techniques and considerations.

8. There is no substitute for experience! Both crews had an exceptional front and back end, including the Pararescue Jumpers (PJs). Flight time for the front-enders of 11 was around 3,000 hours, and 4,500 for the front of 12. The back-enders were experienced as well.

9. Rehearsal of shot-down procedures paid off. We had conducted a walk-through of individual actions if forced down. This provided a good template for our initial security and bug-out plan.

10. Personal Survival Kits (PSK): Not only "dress to egress," but pack what you need to avoid freezing to death. Some of us wished we had brought more cold-weather gear.

11. Never assume! We were lulled into a false sense of security on the ground with zero-zero conditions and no other contact after the initial sighting of headlights. After an eight-hour vigil of scanning for threats, we became complacent. The barren conditions jibed with the map (no towns or roads), leading us to believe we were all alone. *Wrong!*

While the weather was still marginal, with clouds still at about 100 feet AGL, the visibility slowly started to improve. We were concerned about doing a whiteout takeoff and inadvertently entering the low cloud deck. We dumped gas and ran the Take Off and Landing Data (TOLD) numbers no less than 50 times. Then, out of nowhere, three "local citizens" approached the aircraft with another 50 or so standing about 100 meters away. It was time to "get while the getting was good." We had cocked the aircraft on shutdown, and this expedited our scramble and takeoff. The PJs challenged the locals, and they kept their distance.

We were unable to continue our planned route due to heavy ground fog. We confirmed the weather was good, climbed to 11,000 MSL to get above the clouds, and proceeded direct to the FOB. We coordinated with the alert tanker during our scramble, to refuel us. In order to have the power to depart the mountaintop, we had to dump fuel to a level that only afforded us enough gas to get home direct, with no "wiggle room." After aerial refueling, the remainder of the flight was uneventful.

THAT OTHERS MAY LIVE

The Rescue community will continue to operate in rapidly changing conditions where the tolerance for error is almost non-existent. It is critical that we continue to train to the standards and not only review past lessons learned, but apply them in the training process, so crews don't repeat them. We are tasked with our missions because we are the only ones capable of completing them. The only way we will be able to safely "complete any mission, any place, any time" is to train for that unknown place and time in a myriad of environmental conditions, applying past lessons learned and not coming up with any new ones.

These things we do … that others may live.

Racing A Storm

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USAF Photo by SSgt P. J. Farlin
Photo Illustration by Dan Harman

I've always considered myself a "lean forward" kind of pilot. This is not to suggest that I'm willing to break regulations or do anything unsafe, but when given the opportunity to cancel for a minor weather or maintenance issue, I'm definitely more inclined to find a solution and press on. Like all pilots, my attitude has been shaped over the years by my experiences. Some have been good, some have been bad, some have been tense, and some have made me think maybe I should find a new line of work. Luckily I've made it through all of them, and I like to think that I've learned something from most of them.

One of my first memorable experiences came a little over a year into my first operational flying assignment, in the C-21. I was a new aircraft commander, with less than 100 hours in command, and still a first lieutenant. My co-pilot, as luck would have it, was one of the newest pilots in my unit, fresh out of UPT. Our mission took us from Offutt AFB (our home station) through a few intermediate stops to an overnight stay at Andrews. The next day we were to fly from Andrews to Scott to pick up our passenger, a major general, and drop him off at Denver International before returning to Offutt.

After a long but relatively simple day of flying, we got a good night's rest at Andrews. Unfortunately the simple part was over, and the first sign of trouble came when we showed for the second day of the mission. The weather briefer at Andrews told us a large winter storm front would be rolling through Denver that night, just after we were scheduled to depart. It was forecast to bring heavy snow, low visibility, and poor runway conditions. No problem, I thought, we'll just get ahead of schedule and make sure to beat the storm. That was usually pretty easy to do in the C-21, as the DV passengers are often ready to go up to half an hour before scheduled takeoff time and appreciate getting to their destination as early as possible. And in the meantime, the weather was on our side. Day VFR conditions throughout the eastern United States meant we'd have no trouble getting to Scott, preparing for the general, and taking off early to beat the storm.

The first big decision I had to make that day, and in hindsight the most important, was how much fuel to take at Scott. As always, upon landing we went inside to check the NOTAMs, make sure our flight plan was in the system, and request an update to our weather briefing. Naturally, I was hoping the weather briefer would tell me the frontal passage had slowed down and left us with a night of clear skies ahead. No such luck—it was now forecast to hit Denver just half an hour after our scheduled departure. While not a show-stopper, that didn't give us much time to slip. A late departure from Scott, or any en route delays, would put us very close to getting stuck in Denver for the night. Obviously, spending a night in Denver wouldn't be such a bad thing, but when you're supposed to get home tonight, you want to get home tonight.

The arrival weather at Denver was good enough that we didn't require an alternate. But considering the looming storm, I asked for the forecast at Colorado Springs and Pueblo, just to be safe. Both airports were calling for clear weather, so I felt confident that even if we didn't beat the storm, we'd have two good options for landing to the south.

And now the big question: How much gas to put on the aircraft? En route plus reserves from Scott to Denver wasn't a lot, and without a required alternate I could have legally settled for that. Luckily, the little safety voice in my head was speaking up that day, so I decided to put on enough gas to make Pueblo if I needed to.

Then came the decision that turned out to save my butt. I knew that if we got a little behind schedule, or if the front hit Denver early (or both), we could still make it home if we quick-turned through Denver without having to refuel. And since the required en route plus reserve fuel was pretty low, we had plenty of room to add the gas we'd need to make it all the way back to Offutt.

So, we packed on the fuel, pre-flighted the jet, and waited for the general to arrive. Unfortunately he wasn't aware of the impending storm in Denver, or my desire to make it back home that night, and because he was stationed at Scott he probably wasn't in a big rush to leave. He showed up right at takeoff time, and we departed for Colorado.

A few checks with Flight Watch along the way were encouraging. Current conditions at Denver were windy, but clear, and the storm still wasn't forecast to hit until after our departure. As Murphy would have it, the weather reports kept on like that until we were approaching the terminal area. Unfortunately, the front stepped up its pace and ended up arriving at the same time we did. Since it was just getting started, and the visibility and ceiling were still well above approach minimums, we should have been able to land without too much trouble.

Just one problem—the ATIS was calling freezing rain. Like many aircraft, the C-21 is prohibited from landing in freezing rain, so it was time to execute Plan B. I had my copilot contact Flight Watch to get the weather for Colorado Springs and Pueblo while I told Denver Center we had to divert. Then my co-pilot gave me the bad news—small aircraft pilots in both terminal areas had recently given Pireps of severe turbulence. Scratch the divert to the south.

Now things were starting to get a little tense, but I still had another good option in mind—Cheyenne, Wyoming. Cheyenne is just north of Denver, it has a great FBO, and it would put the general within a short drive of his meeting the next morning. One more call to Flight Watch revealed that Cheyenne's weather wasn't great, but it was above minimums. We coordinated the divert with Denver Approach and started on vectors to the north.

Everything was proceeding nicely, and we had started our descent into Cheyenne's terminal area, when we hit our third stroke of bad luck. Before descending into the thick overcast layer at 15,000 feet, we energized all of our anti-ice systems to prepare for the known icing conditions beneath us. Passing through 12,000 feet, the right engine anti-ice annunciator illuminated, indicating that the valve was closed and the nacelle was getting no bleed air.

As I told my copilot to pull out the checklist, I pushed up the throttle on the No. 2 engine and recycled the switch. No luck. No luck with the rest of the steps, either. By the time we finished running the checklist, I had already requested a climb and gotten back into the clear weather above the clouds.

Now it was time to make the tough decision. Being a brand-new AC with a brand-new co-pilot didn't help my nerves. Neither did Denver Center 's asking me what my intentions were. And neither did the general's wish to get to Denver, or at least close to it, for his early morning meeting. Luckily, I had put on enough gas at Scott to make it back to Offutt. So, what was I going to do with it? I considered using it to hold and hope for the weather to improve, or to keep troubleshooting the anti-ice malfunction, or to look for another nearby alternate that would have gotten the general close to Denver for the night.

But I had reached my limit. After racing a storm all day and then contending with freezing rain at my destination, severe turbulence at my first two alternates, and inoperative engine anti-ice, I was ready to take my fuel and go home. I knew the weather back at Offutt was clear, and I knew I could make it there with the required reserves if I left right now. The general wasn't happy about it, but meetings can be re-scheduled.

Looking back on that trip, I realize how lucky I was. My plan for the storm was to try to outrun it, with enough alternate fuel to make a nearby divert base. The additional fuel to get us back to Offutt was intended for a quick turn at Denver, not an inflight divert. If we had been planning to spend the night at Denver, I probably wouldn't have put it on. I was also extremely lucky to have a very mature young co-pilot who stayed focused, worked the radios, got me weather for all our alternates, and ran an emergency checklist quickly and calmly.

That mission taught me a few very important lessons. First, just because the weather forecast says your destination is going to be fine for arrival doesn't guarantee anything. Second, when a large front is approaching one city, don't be surprised if it ends up affecting nearby terminal areas as well. Finally, staying flexible and giving yourself plenty of options can help you safely handle almost any situation.

Fogged Over

CAPT SCOTT W. WALKER
31 FW
Aviano AB Italy

Fall in Aviano, Italy, brings with it the usual foggy mornings. For about three months fog can dominate the landscape. Although Aviano AB is nestled against the southern edge of the Italian Dolomites (part of the Alps), it actually sits in a low-lying valley, at only 300 feet above sea level. It is edged by mountains to the north and east, and by higher ground farther off the west. Therefore, during this part of the year, fog rolls in from the Adriatic and gets funneled into this low-lying basin, with nowhere else to go.

With two F-16 fighter squadrons and one helicopter squadron assigned to the base, weather can play a major factor in mission planning. Obviously, fighter aircraft and helicopters do not have the fuel to divert long distances or hold for hours at a time, waiting for the weather to change. So, when much of the north coast of Italy gets fog, many of our primary diverts fall under the weather, as well. However, business must go on , because the weather can clear up just as fast as it rolled in.

On one such occasion in the fall of '03, we had a few days in succession when the morning and sometimes the afternoon "Goes" (sortie periods) were canceled. So, the need to get airborne and get training done started to move higher up the scale. On this day I was going out as a two-ship with my flight lead to be Red Air for a four-ship of Blue Air (4v2). Nothing too difficult for either group, and all the planning and briefing was done in accordance with regulations. The weather just would not cooperate the same as it had the last few days.

Despite the lack of visibility to take off, we stepped to the jets and started, hoping we would get a break in the fog. Everything was going as planned, and visibility on and around the runway was a couple of hundred feet, enough to taxi to the hammerhead for arming. After arming, we crossed the runway to free up space, so Blue Air could arm up. While we sat there, the fog seemed to get worse and the visibility was steadily dropping. Every 10 to 15 minutes, the flight lead would get a weather status from the SOF (Supervisor of Flying) sitting in the tower. While we waited, our actual training time in the area was getting shorter and shorter every minute we spent running on the ground. And the chance of reaching our primary divert field was getting smaller.

Finally, it was decided we wouldn't be able to launch out on our planned 4v2 to the area. However, in our hope to log some sort of training, we waited in the hammerhead for the visibility to launch on an instrument sortie. Now the visibility was getting down to about 50 feet horizontally. The ironic thing was you could look straight up and see blue sky about 100 feet above, so the fog wasn't that thick vertically.

The longer we sat, the worse the fog was getting. Eventually. the visibility got down to only a few feet. We got our last weather update from the SOF, and he informed us that the OG had canceled flying for that morning, so we were to taxi back in. Now we had another problem: We didn't have enough visibility to taxi. At this point, when I looked to

USAF Photo / Photo Illustration by Dan Harman

either side of my jet, I couldn't see the other jets that were sitting less than 10 feet away from me. I also couldn't see the yellow taxi lines on the taxiway. So, we were forced to sit there and wait for the weather to get better.

The weather eventually started to cooperate, and we were getting short periods of increased visibility, enough to taxi, at least. However, now there was an AWACS on final trying to land so they didn't have to divert. Therefore, ground told everyone to stay where they were, since he couldn't see us and didn't want anyone accidentally taxing near or onto the runway. I don't know what the weather was when the AWACS entered the radar pattern, or if it had been holding for a while and decided to give the approach a try before deciding to divert. However, I knew the likelihood of them landing here was slim to none.

We all complied with the instructions and sat waiting for the AWACS to go missed approach, so we could all taxi back and call it a day. A few minutes after the AWACS called final with the gear down, I started to hear a low rumbling sound. At first I thought it might be my jet, so I quickly checked my engine instruments and found nothing out of the ordinary. The rumble was steadily getting louder though, and as I looked straight up above me I could see the AWACS with engines near full-throttle going missed approach. I can't say for certain what his altitude was, but he was low enough that I, along with everyone else sitting in the hammerhead, felt very uncomfortable when he passed by. The SOF felt the same way, as he passed over the tower a few thousand feet down the runway.

The AWACS then called up the tower and informed them they were diverting to Germany. As for the rest of us, we were anxious to get back to the chocks and get clear of the runway. We now had enough visibility to legally taxi. However, to be safe, and since we still couldn't see more than 100 feet, the flight lead told the tower we would taxi back one at a time and inform them when we were in the chocks, so the next jet could taxi. Tower offered to send out the follow-me truck, but we refused since that might have caused more problems with the fog so thick.

The biggest lesson I took away with me that day was the need for every aspect of flying operations to be safe and professional. All the flight leads adhered to the regulations and didn't push a bad weather situation into a possible accident situation. The tower crews and the SOF did everything by the book to keep the AWACS crew and us safe. Even though it seemed close to us on the ground, the AWACS crew followed the published missed approach procedures, and then diverted to Germany. The squadron leadership stood behind the decisions of the SOF and flight lead, even with the need for training stacking up.

All in all, safe and professional decisions were made, and we didn't get "blinded by the fog."

Dress To Egress

CAPT CARL HANEY
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Grand ForksAFB ND

USAF Photo TSgt Mike Buytas

One night as I tried to survive my first winter in the icy tundra of Grand Forks, North Dakota, I learned (or should I say relearned) to dress to egress. At my previous assignment it would get cold, but nothing could prepare me for the bitter weather of Grand Forks and the fateful night.

It all began innocently enough. We (the co-pilot, the boom, an IP and I) showed at the regular time to brief up the show-and-go mission. It was around 25 degrees below zero, with the wind chill making it about ten degrees cooler. The pre-mission brief went smoothly enough, and the weather was going to be fine, other than the bitter cold. We headed out to accomplish the preflight. In the KC-135, the pilot usually does the exterior inspection and the co-pilot and boom (and IP usually) will go upstairs into the cockpit and start the interior inspection. Of course, part of their inspection is to get the APU running, so we can get a nice toasty cockpit to nestle in for the duration of our sortie.

Everything with the exterior inspection was fine, other than I realized why they issue long johns. I had not put mine on, because cold never really bothered me (I had never really been exposed to this type of cold before this night, for any time) and I knew the cockpit would be warm. As expected, when I got into the cockpit, the APU was running. I discarded my coat immediately and continued on with the preflight.

The rest of the preflight went smoothly, and we started all four engines normally. That was when the chaos began. About that time, the boom asked, "Do you guys smell smoke?" The co-pilot and I didn't, and responded negatively. While we were responding, the boom and the IP, who was sitting in the jump seat, looked to the rear of the aircraft and saw a wall of smoke moving sinisterly forward. They called for the egress. Looking back

on it, I don't think it was the call for the egress that made me snap to the realization that we needed to get off the aircraft. Rather, it was seeing the IP's rear end as he was leaving his station that made me fully realize the gravity of the situation.

At any rate, the co-pilot and I initiated the required egress checklists, using the DSTABB (depressurize, starters, throttles, APU, brakes, battery) checklist, technique for when there are no passengers aboard. We were already depressurized, so while I was finishing the rest of the checklist the co-pilot was telling the ground controllers we were emergency ground egressing. I repeated the message over command post frequency before turning off the battery switch. I then followed the co-pilot out of the seat and realized that I had no idea where I had thrown my coat; neither did the co-pilot. I had already decided I would just leave the coat upstairs, but the co-pilot spent a few extra seconds looking for his jacket. This also delayed my egress, because I had decided that as the "pilot in command," I would always be the last to egress in a "controlled" situation. After a few seconds the co-pilot gave up his hunt for his coat, and we entered the bitter cold. Talk about out of the frying pan and into the fire—although there was nothing "hot" about the situation, with me in no coat *and* no long johns.

The co-pilot and I met up with the rest of the crew at the pre-designated spot we had allocated before the preflight. That's when we found out that, unknown to the co-pilot and me, the boom operator had grabbed all the coats and thrown them down the entry chute when he egressed. Those possible vital seconds in frantic search were all for naught. Fortunately for us, a maintenance bread truck pulled up to us so we could stay "warm" (considering the bread truck was not heated, and it was a toasty minus 35 degrees in there) as we waited for the fire department to respond.

As with all scenarios, it was only after the fiasco was over that we realized what we could have done differently to keep the situation from becoming far worse.

Using the Operational Risk Management steps, the following things could be identified:

1. Identify the risk: This one is relatively simple … dress to egress.

2. Assess the risk: Which is worse, being in a fume-filled aircraft where we don't know what is wrong, or egressing into incredibly cold temperatures? Obviously, the aircraft is much worse. But entering the bitter cold without proper winter protection has many risks as well—some as severe as the aircraft, especially if you have to spend prolonged time in the cold. As for exposure…because we didn't know the location of our coats, we increased our exposure to the fumes while looking for them. And we increased our exposure to the extreme cold by not having them, thereby increasing our risk in both hazardous conditions.

3. Analyze risk control measures. Wasting valuable time in an egress trying to find a coat is unacceptable, and so is stepping out into minus 35 degrees without any protection … so the problem needs to be fixed. Obviously, the malfunction of the aircraft (which turned out to be just being a bad seal which caused exhaust to enter the aircraft) and the weather are beyond our control. We can only nullify the hazards by reducing our exposure to each of those elements.

4. Make control decisions: Many ways exist to mitigate the threat. The simplest one is to wear your winter protective gear (including long johns) at all times, where an egress is possible. Although I am guessing that many of you, like me, don't like wearing a cumbersome jacket when flying, I determined the best way to alleviate this problem is during the pre-mission brief by reminding the crew of the potential hazard. I implemented a personal rule: Jackets must be placed either behind the crew station seats or where they are easily obtainable during egress, so valuable time isn't lost trying to find them when the concern should be getting out of the aircraft. We were fortunate that the boom operator had the situational awareness to throw them down the hatch so we wouldn't freeze.

5. Implement: Briefing this during the pre-mission brief does seem to work. I noticed that bringing up the subject not only makes the crew aware of the risk, but also brings them out of the pre-mission haze. You know the one I mean … the one where the entire crew tends to be out in "la-la land" because of the same mundane brief where everyone says the exact same thing in the exact same way. It only takes a minute, but it also seems to have a favorable ripple effect.

6. Supervise and review: In the KC-135, this is quite simple, as we aircraft commanders are the last to come aboard after we accomplish the exterior inspection, and all we have to do is put it into our crosscheck when we climb up into the cabin. Feedback I have received from my crews has also been very favorable, because I am not forcing them to wear their coats and yet I am bringing a very real risk potential to their attention.

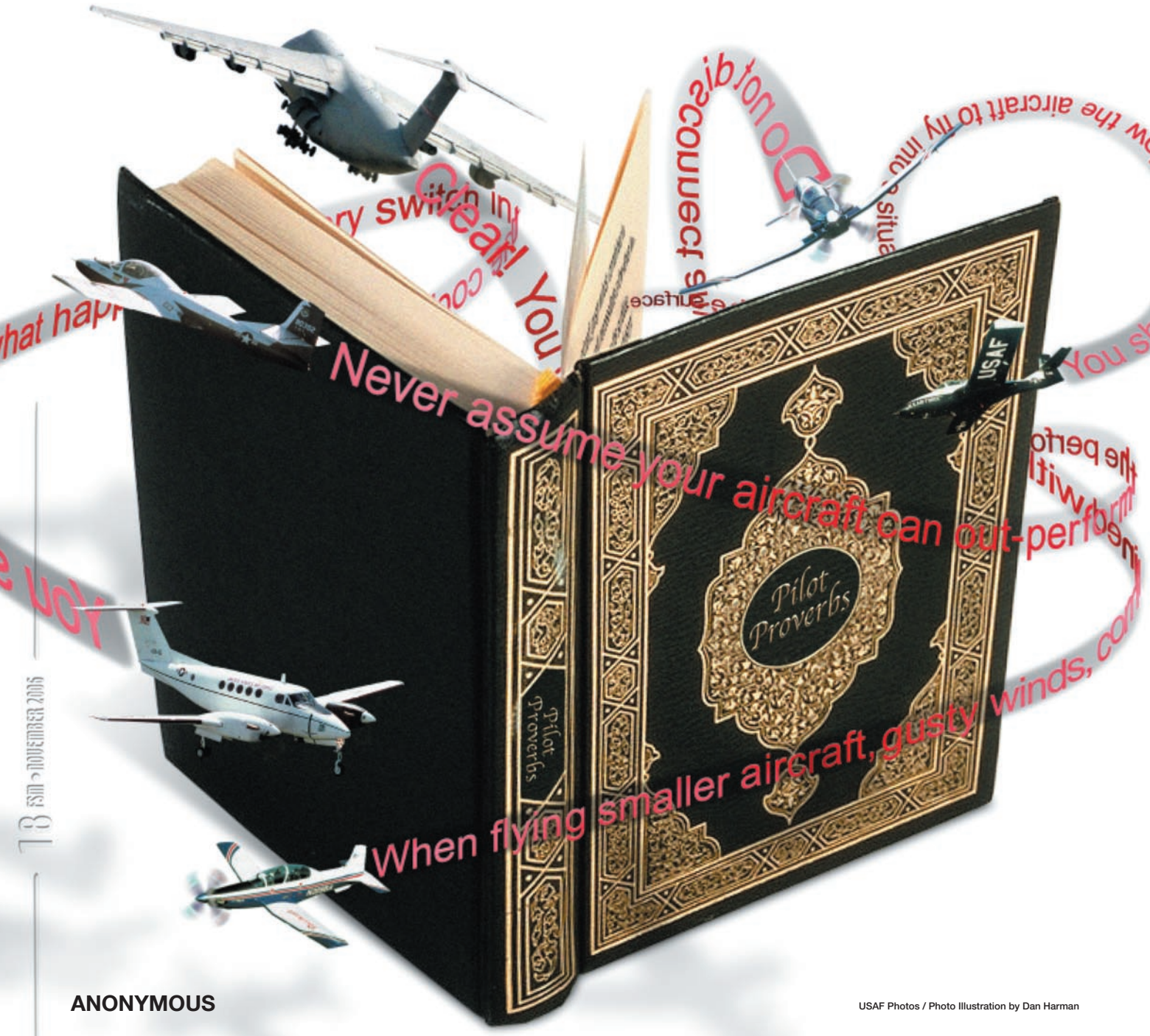
Obviously, the extreme temperatures experienced at Grand Forks are uncommon in most regions of the country. However, I think this story still sheds an important light on something we often forget: An ounce of prevention is worth a pound of cure. Just a few extra seconds reminding the crew of the potential hazards involved can go a long way in protecting the crew and mitigating the risk. After all, that's one thing these articles are for, to remind us of lessons we might have forgotten.

Something as simple as "Dress to Egress" can be extremely easy to overlook, but it's easily rectified if you keep it in your crosscheck.


Egress can happen anywhere.

Dress for it!

USAF Photo by MSgt Jose Lopez Jr.



ANONYMOUS

USAF Photos / Photo Illustration by Dan Harman

In 18 years and more than 6,000 hours of flying in the United States Air Force, I picked up a few expressions that I incorporated into my operating routine. I flew some of the smallest and largest aircraft, including the C-12, T-37, C-5 and T-6. I was at least an instructor in every aircraft I've flown. Somehow, the list keeps expanding, although I must admit not as much in the latter years. Many of you will be familiar with some of the more popular thoughts.

I call this list of expressions my Pilot Proverbs. Some I picked up as a young pilot trying to emulate those more experienced than I. Some I learned at the club, telling stories over a frosty beverage. Some of these were learned the hard way, either by me or by someone else. Some are humorous—but only after they become memories and you live to tell about it.

Currency does not equal proficiency. Currency keeps the DO satisfied and proficiency keeps the pilot satisfied.

To compute fuel: Measure with a micrometer and cut with an axe. It only takes one landing short of your destination (to refuel) to burn up all the gas saved on dozens of sorties using stringent fuel planning.

Fuel means time, time means options, and options are good.

The aircraft needs fuel and the crew needs fuel. Don't let command and control convince you that the forgotten box lunches for the crew are not necessary for your nine-hour mission. A delayed departure by 20 minutes is acceptable if this happens.

If the forecast has thunderstorms in the vicinity, call PMSV en route to get an update on where the storms are and where they are going.

When flying smaller aircraft, gusty winds, combined with turbulence on the surface usually necessitate a low-level wind shear advisory.

You should know what happens with every switch in the cockpit. If you don't, look it up.

Fly the aircraft while on the runway, even at non-flying speeds.

Never go across the Atlantic without a destination, no matter how many promises by your command and control to "work it" for you en route.

Never take off without the proper diplomatic clearances, no matter how many promises by your command and control to "work it" for you en route.

Take names and follow up when something happens. "Shift change" is not a viable excuse for command and control to drop the ball. Try using "shift change" the next time you get in trouble with your spouse.

If you have an emergency on the ground, stay on the ground. If you have an emergency in the air, stay in the air until you can safely put the aircraft on the ground. The hasty transition between the two will get you in trouble.

If your gear does not retract, extend it. If it extends, leave it alone.

Never assume your aircraft can out-perform the performance data. Aircraft designers and engineers don't really "pad" their figures.

Do not disconnect anything in the cockpit, especially during flight, when the electrical device is operating normally all by itself. Curious pilots should be discouraged from this immediately.

Fly the aircraft even if you are not actuating the controls. If you sit at a set of flight controls, be ready to fly. Maintain a posture and presence of mind to take over at any second.

You should never allow the aircraft to fly into a situation you have not foreseen. Be in charge of your destiny.

When avoiding thunderstorms in flight, use the Mark I eyeballs in conjunction with the weather radar. Don't make the thunderstorm go away by adjusting the tilt up to your level. One pilot's cloud "blow-off" is to most pilots an "anvil."

The thinnest portion of the thunderstorm line can be the worst area if your weather radar starts attenuating. Don't be afraid to call for help from ATC to get you out of a thunderstorm.

P_K of the ground is 100 percent. Sure, some have proven this not true, but do you want to test it?

Clear! You will never hit an aircraft you see.

If your landing gear does not come down, relax--you have the rest of your gas to try to figure out how to get it down.

You should never see the runway out of side windshield during a landing while the front windshield looks "more grassy."

Go-arounds are free.

Try to never, ever porpoise a 500,000-pound aircraft. Don't be afraid to take the aircraft from your Squadron Commander when he does.

Do not use reverse thrust when landing in a snowstorm.

Do not exit the runway "Matrix-style." When exiting the runway, make sure you are at a safe speed. Each skid mark leading up to the turn-off has a story of confidence turned to consequence.

If using reverse thrust to back your aircraft, never use the brakes. This is sometimes referred to as a "stoppie."

If the ramp is so icy that the aircraft slides away under idle power (full brakes applied), use the thrust reversers to stop (if you have them). Go back to bed.

Teach to perfection, evaluate to the standards.

Your best student will be the one who gets you in trouble.

Don't lose your credibility by guessing the answer, especially if you just asked the question. Look it up, and then you will both know the answer.

As an instructor, a peek is worth a thousand crosschecks. It is not cheating if it builds situational awareness.

Do not leave the stick off the backstop during an intentional spin entry.

Do not "ease it forward" during the spin.

Do push it forward to break the stall.

Do recover from the resulting dive and avoid excessive altitude loss.

As an instructor, when I say, "I have the aircraft," I *really, really* mean it and you should let go.

Flying up initial, a student goes into the break and says, "Flaps, power, pitch, roll." Take the aircraft, move the flaps back to the up position, and after the next pattern to a full stop, write up the over-sped flaps. Ridicule is required. See below.

There is no time when an instructor should use fear, sarcasm, and ridicule. Who said that? I remember every single lesson involving fear, sarcasm, and ridicule.

Always take the aircraft from a student at the point where you can still fly it. After that, you're making a pilot proverb.

I'm sure there are many more of these thoughts roaming around in your flying organization. Feel free to keep the list going. I probably knew more of them once, but like most knowledge, it leaked out of my head in the form of gray hair. I'll leave you with one of my favorite proverbs often used on younger pilots: I've forgotten more than you will ever know….

Pins Panels and Puddles

USAF Photo by SSgt Jason W. Gamble

ANONYMOUS

Many of us have heard stories of other people screwing up, and more often than not, we think, "That could never happen to me." This is my story of how one should never think they are impervious to making a mistake.

While going through Undergraduate Pilot Training (UPT), you're receiving information out of a proverbial fire hose. You're being bombarded with a constant flow of information from your classes, books, IPs, simulators and flights. Much of that information doesn't stick, but the stuff that does usually stays with you for your entire career.

An instructor once taught me to do one final check before jumping in and strapping into a jet. He told me to look at the forms, do my walkaround, and before hopping in, walk a few paces in front of the jet and look for pins, panels or puddles. What he meant was to look for pins that should be removed before flight, look for loose panels or access doors that should be closed, and ensure there wasn't a big puddle of a vital fluid leaking onto the ground that should otherwise be in the fuel, hydraulic or oil system. I have used that check ever since.

I have always taken great pride in being thorough in my preflight checks, from checking the forms to my walkaround. Because of this, I have caught many things that were missed. However, on a sunny day in December 2005, both my crew chief and I failed to see something that could have had severe consequences.

I was sitting alert, and my flight lead and I were scheduled for a practice scramble. These are a good way to exercise the Air Traffic Control system, as well as to give us and our crew chiefs practice in scramble procedures. We briefed up the sortie about an hour-and-a-half before our scheduled time, and talked about the mission-specific objectives we were going to accomplish during the sortie. We also covered any contingencies that could occur.

After we finished briefing, I went out to my aircraft to ensure that I had all of my mission materials in order, and that my cockpit setup was going to be adequate for our practice scramble. I also used this time to give the plane a last look, to ensure that all of the pre-scramble pins were removed, panels that should have been closed were closed, and that there were no puddles underneath the aircraft. After this last walkaround, I went back into the alert facility, ate lunch, and waited for the horn to go off.

About an hour later, within a few minutes of when we expected to get scrambled, the horn went

off, sending my crew chiefs, flight lead and me into action. As we ran out to the jets, I was going over the things I wanted to make sure I didn't screw up. I quickly put on my G-suit and harness, then climbed up the ladder and got strapped in. Once I established comm with my crew chief, he gave me clearance to start the jet. I promptly moved the Jet Fuel Starter (JFS) switch to the JFS start 2 position, but nothing happened. I had reviewed the forms for that aircraft thoroughly and remembered that the previous crew had problems with the JFS unit, but I had been assured the problem had been fixed. Boy, I wish I had a dollar for every time I've heard that!

When I set up my cockpit for alert scrambles, I always keep my flight materials in or near my helmet bag, so if I have to jump to a different jet, I don't have to gather a bunch of mission materials from all over the cockpit. This technique proved to be a good one in this case because when my jet didn't start, I disconnected my straps, grabbed my helmet bag and I was off to the spare.

Upon reaching the spare jet, my crew chief was just climbing down the ladder, after having pulled the seat pins and readying the aircraft for flight. I then climbed up the ladder, got strapped in, established comm with my crew chief and started the jet without further incident. By this time I was a couple of minutes behind my flight lead and was hurrying to catch up. We were still doing well on our scramble timeline, so my flight lead elected to wait until I was ready, so we could taxi out together.

The rest of the flight was uneventful. We took off within our prescribed time limits and fulfilled our obligation as per the Air Tasking Order for the day. After getting clearance to RTB by our controller, we headed home for a full stop. After landing, we taxied back to the chocks and accomplished a series of compulsory checks, so that the jet was ready for the next scramble. Once I had completed those checks, I shut down the aircraft and proceeded to unstrap and climb out.

Then I discovered I had forgotten a very important thing. I had just sat down on the top of the ladder and swung my legs around to begin my climb down when a flash of orange caught my eye. I just sat there for a second, trying to make sense of what I had seen, before I turned around to take a second look. I thought to myself, "How did my crew chief already climb up here and install the pins so quickly? What in the …?!" Countless thoughts went through my head before I turned around to verify what I thought I saw.

When I turned around, I discovered an orange streamer, the one that belongs to the ejection seat pitot tube covers. It is important to remove these covers from the ejection seat pitot tubes because they prevent the seat from sensing airspeed. Without any airspeed information, the seat defaults to Mode 1 operation, which is low speed (<250 kts) and low altitude (<14,500 MSL). This is especially important if one ejected at high altitude and high airspeed. If the seat were operating normally in this scenario, the seat would sense that it is at high altitude and high airspeed, thus driving it into a Mode 3 condition. When the seat operates in Mode 3, a small drogue chute deploys to slow the seat to Mode 1 parameters before man-seat separation occurs and the main chute deploys.

Had I ejected at high altitude and high airspeed (or just at high airspeed) and the ejection seat pitot tube covers did not blow off, the seat would have been forced to operate under Mode 1 conditions. The result would have been that the drogue chute would not have deployed to slow my airspeed, man-seat separation would have occurred, and the main parachute would have deployed at a very high airspeed. This could have been catastrophic, from failure of the parachute to ripping me in half from the opening shock. Either way, it would have been a very bad deal.

After calling the crew chief over, I asked him if anything looked peculiar in the cockpit. He gave me a puzzled look and asked what I meant. I then pointed to the streamer. I told him we both had missed it during the pre-launch sequence, and that I had flown with a seat that more than likely would not have worked properly. I think he was expecting me to start chewing him out, but I figured that would do no good. The lesson had already been learned for both of us. We then discussed what had broken down in the launch sequence that led to both of us missing the covers and associated streamer. I told him I had climbed up the ladder and actually looked for pins and streamers, but only looked directly at the seat cushion. I didn't bother to look at the back of the seat, or else I would have discovered the big orange streamer that was staring me in the face.

The bottom line is that in my haste to get into the spare aircraft and launch to meet our scramble timeline, I missed a very important step to my pre-launch sequence that I had never missed previously. The lesson learned is that no matter how much experience one has, or how careful one is in the normal preflight inspections, lapses in concentration or channelized attention can lead to missing even the most obvious of things. Had I been more vigilant in my "pins, panels and puddles" technique, or actually taken a second to look around and take in what I was seeing, I surely would have discovered the ejection seat pitot covers and the bright orange streamer.

Fortunately, in this instance nothing happened, and both my crew chief and I learned from our mistake. I have since incorporated some of the more obvious "gotchas" into my alert brief. And I always use the "pins, panels and puddles" method as a final check.

Knowing Your Business

CAPT ANDY "BISHOP" JACOB
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USAF Photos / Photo Illustration by Dan Harman

There are two types of pilots flying today… those who have had a major airborne emergency and those who will. I, luckily, have been one of the fortunate ones who haven't had to deal with a "barn burner" type of emergency procedure (EP). I realize that the previous statement has probably just sentenced me to a future of emergencies, but as I start knocking on wood I'm also trying to think about how I'm going to handle the impending situation. From a safety standpoint the emphasis, whether it be while flying or on the ground, should focus on identification and prevention of situations that lead to accidents. Realizing that you probably will have a major EP (or will have *another*, for you unlucky folks out there), there are a few things you can do to stop the problem before it ever happens. It all starts with knowing a few things…your aircraft, yourself and your people.

Know Your Aircraft

It's no secret that most aircraft in the US Air Force inventory are old and, like us, not getting any younger. Take the mighty B-52, for example. The "Buff" is approaching 50 years old and is being asked to fly for another 50 years. None of the engineers in 1950 could ever have thought that the plane would be flying today, much less another half-century from now. It's for this reason that solid systems knowledge and constant emergency procedures training is imperative.

But it's not that simple anymore. More and more, the Dash-1 checklist doesn't have the answer as some freak EP afflicts your aircraft. While very few of us in the Air Force are test pilots, we are going to have to start thinking like test pilots when an EP pops up that no one has ever seen. "How am I going to solve a problem that's not in the checklist?" you ask. Well, it's going to take a very strong knowledge of your aircraft systems to be able to think through the problem, act appropriately and bring the aircraft back safely. And while I have talked mostly about the older airplanes in the inventory, the newest aircraft are not exempt. While planes like the F-22 and T-6 sport the

latest in technological advances and have safety systems that put the older platforms to shame, there is no pilot, engineer, or safety manager in the world who can predict every failure mode of every piece of equipment. It's going to take smart pilots and crews to think through and analyze the problem with the help of the current guidance and tech orders. Let me stress that the Dash-1 checklist is the perfect place to start and will, in most situations, help solve the problem. But after all resources have been exhausted it's time to rely on your systems knowledge to make an intelligent decision and bring you, your crew, and the aircraft back.

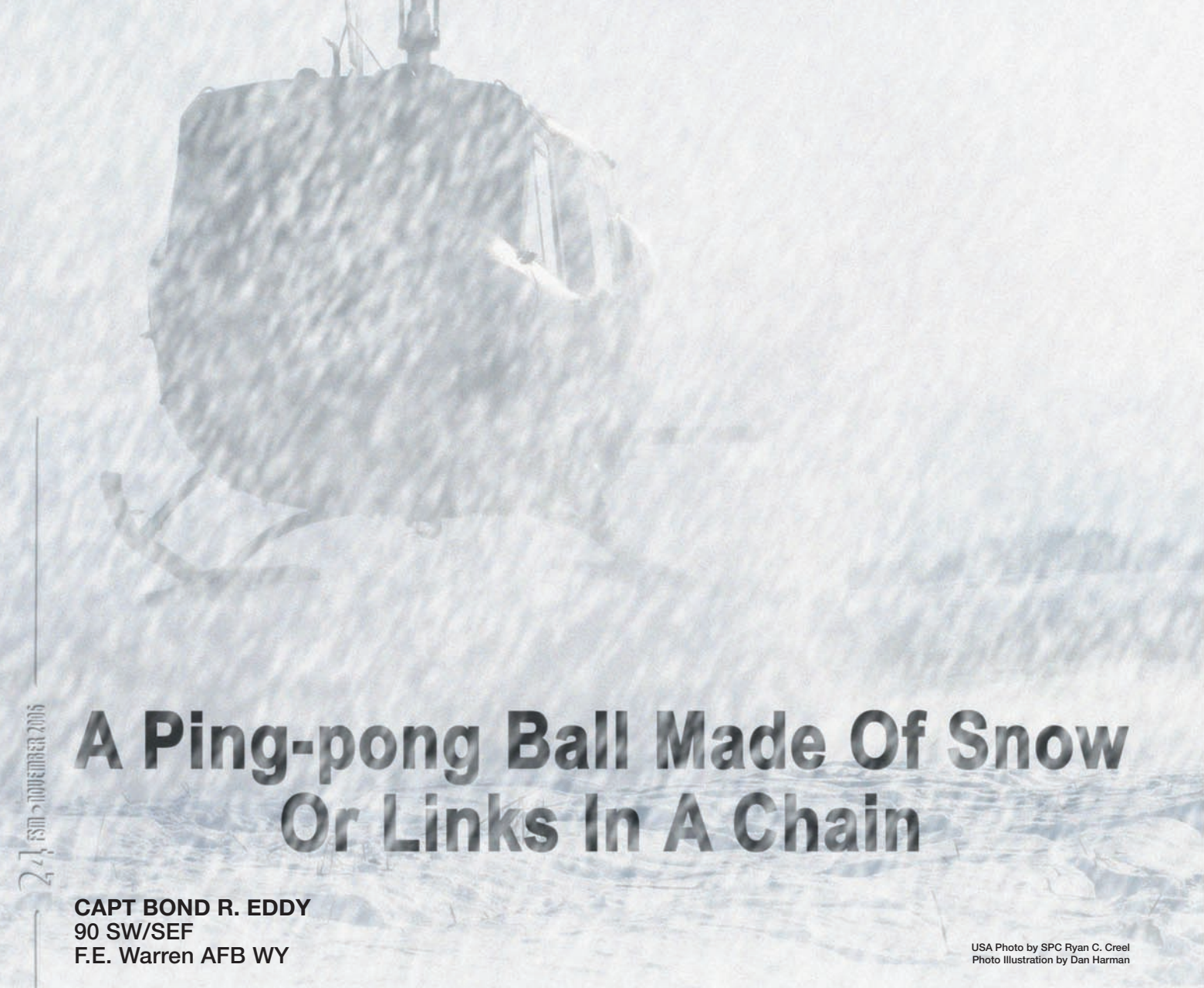
Know Yourself

I can already hear the Type-A personalities, as most of us are, begin to scoff as they read the title of this section, but admit it: We've all had days where things weren't going our way. Whether it's stress at home, not enough sleep, or a minor injury sustained in a pickup game of basketball, sometimes you're going to have to call "Knock It Off." It's in our nature as pilots to lean forward to get the job done only to come back the next day to do it all over again, but we need to make sure we know our personal limits and stay within them. A look back at mishaps in the past indicates that a majority of accidents have been wholly or partly due to human factors. Issues like G-LOC, spatial disorientation and visual illusions can quickly become life-threatening situations which can be avoided or eliminated by an honest assessment of your mental and physical states prior to the sortie. Whether you fly in the high-speed, high-G environment of the fighter pilot, or get to endure the long marathon sorties of the bomber and transport pilot, all of us need to make sure we individually assess our abilities at that time, ensure we're capable of performing the mission, and take care of the asset we are being asked to employ.

Know Your People

How many times after a long week have you looked at your crew or wingmen prior to a sortie and seen a room full of glassy eyes and million-mile stares? Being able to read people is one of the most important skills you can have, not only from a flying perspective but in all aspects of life. As I talked about in the previous paragraph, the Type-A personality is going to do everything he/she can to get the job done, even when it's not necessarily a good idea. From the brand-new co-pilot or wingman to the experienced IP, anybody can take the initiative to at least address the issue and possibly make the call that prevents a mishap from occurring. For the most part, you usually spend eight to twelve hours a day with people you fly and work with. Use some of that time to try to assess the moods and body language of your buds under different situations and use that information to make smart decisions, both airborne and on the ground. Trust me, most of the time you're saying exactly what the rest of the team thinks; they just don't want to say it themselves.

US Air Force pilots are some of the smartest, most disciplined and motivated people you will meet in your lifetime. Armed with knowledge of your systems, yourself, and your people you will be able to safely and effectively manage almost any situation out there, before it ever comes close to happening. In addition, when the "barn burner" EP does happen, you'll have the confidence, knowledge and skills to get back safely. Fly Safe.



A Ping-pong Ball Made Of Snow Or Links In A Chain

CAPT BOND R. EDDY
90 SW/SEF
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USA Photo by SPC Ryan C. Creel
Photo Illustration by Dan Harman

Safety experts will tell you that all mishaps are the result of many small events linked together in a mishap chain. If any of these small events or "links in the chain" are removed, the mishap doesn't happen. Recognizing the links before they happen and breaking them before they form a chain is the task of every crewmember. Our chain started linking four days before the actual flight. Our unit's primary mission was to provide airborne security support during the movement of Category 1 (CAT 1) resources at a northern-tier missile base, where it snows quite often.

LINK ONE

When the weather starts to go bad at a missile base, the various agencies involved in a CAT 1 mission (Security Forces, Maintenance and Helo support) all play a game of chicken to see who will cancel first. If you cancel first, you're the lucky unit who gets a no-go mark next to your name on the list the wing king keeps in his head. Say you can't do the mission a few times in a row, and all kinds of interesting questions start getting asked. This mission had been canceled three days in a row due to snow showers. During each of these days, it had been the helicopter commanders who had canceled first, and we were feeling the heat (no pun intended). On Wednesday night, our unit commander notified the scheduler that he was bumping the aircraft commander scheduled to fly tomorrow's mission because he was going to fly it and "make sure this thing gets done."

LINK TWO

This morning turned out to be no different from the three before, because when we reported for work that morning, we were again in the middle of a snow shower. The commander and I started our brief, but only a few moments into it, he was called away to take a phone call from the OG commander.

He returned from the phone call after a few moments (in a bad mood), and we tried to continue our brief. Two or three more steps into the briefing checklist, he was again called away to take a phone call, this time from the wing vice commander. Again after a few minutes (about 10) he returned (in a worse mood), and we tried to continue our brief. No more than one or two minutes later, he was called away a third time to take "an urgent phone call" from the wing commander. Ten to 15 minutes later, he returned (in a really bad mood), and we didn't even try to finish our brief. He determined that we had to step to the aircraft if we were going to take off in time to support the convoy, and we would finish our brief later.

LINK THREE

When we arrived at the flight line, the commander went into the hangar to prebrief with maintenance, while I conducted the preflight. As I was standing on the top of the aircraft in the falling snow, I remember saying to myself we would never fly in this stuff. It's not that we didn't fly in snow (we did that all the time). It was just that our aerodrome was in Class G airspace, and I knew that there were some trees that were exactly half a mile from the parking pads, and I could only make them out occasionally. Class G day VFR requirements were half-mile visibility and clear of clouds. We weren't going to fly because we simply didn't have the weather.

LINK FOUR

When the commander made it to the aircraft, I pointed to the trees over in the cops' training area, and remarked that I couldn't make them out most of the time. I never came right out and said, "We don't have Class G minimums." I didn't need to, right? The boss was an experienced pilot; he would get the drift, right? Wrong. He said, "I'll be &@^#! if we are responsible for canceling today. We'll go up and poke our nose in it and see how it looks." His reasoning was that "There is no way the maintainers will want to drive a payload out to the field in this weather, so they can be responsible for canceling today."

LINK FIVE

We took off and were only able to achieve 300 to 400 feet AGL before we started to lose all ground references in the snow, so the boss elected to stay at 100 AGL and 50 knots in order to keep the payload in sight. Now this was before 9/11, and the regs at the time and personnel manning issues called for these missions to be flown at 500 AGL with short periods down to 300 AGL. Sure, we could fly low-level, but only on missions where we had done a full route study, generated a Form 70 (*Pilot's Flight Plan and Flight Log*), put a route line on the map, etc., I knew this was wrong, but I wasn't going to cross the boss with his foul mood, and besides, maintenance or the cops were going to cancel anyway, right? Wrong again. They rolled, and now here we were 100 feet AGL 50 knots, in the middle of a ping-pong ball made of snow.

LINK SIX

About 45 minutes into the mission, I started to experience some vertigo. You figure it out—white overhead, white in front and white on the ground, with occasional glimpses of the convoy's white semi-trailer on a white road. I tried talking to the commander several times during the first hour of the mission to convey my uneasiness with our situation, but he never answered me. More than once, I looked over at him and could see his lips moving and his mouth in a snarl, but as far as I was concerned, he wasn't there, because he wouldn't answer me. After struggling with the vertigo for 20 minutes and not receiving any feedback from the aircraft commander, I finally elected to turn back to base. I made the announcement to the crew and started a turn to RTB. The commander was back in the aircraft at that point, and asked me what I was doing. I told him (again) that I was experiencing vertigo and was RTB. He took the controls and turned back on course with the comment that we weren't canceling.

LINKS SEVEN AND EIGHT

Because of the distances involved and the speed at which the trucks were forced to move, the plan was for the convoy to hole up at a MAF (missile alert facility) and re-gas one by one, as we went to a Class D airport up ahead on the route to refuel as well. We had the MAF in the GPS and slaved to our number one needle, but how we were going to see it was anybody's guess. The plan was to get to the site ahead of the trucks and land by staying over the road until the slaved needle was at a 30-degree angle from the aircraft heading, and then follow it to the pad. The commander said this way we would have ground references until the last moment and wouldn't have to worry about missing the MAF completely. By default, we wouldn't have to worry about hitting the communications tower on the far side of the MAF. This seemed logical to my little co-pilot brain, and I started to watch the distance count down as we approached the landing site. As the distance counter slipped under .5 NM, I knew we were in trouble, and queried the MAF if they had their lights on. The sites are equipped with those bright

orange-white lights you sometimes see on freeway exits, and we were now .3 NM miles away, with no lights in sight. They replied that their lights were on, and at .12 NM from the site, they came into view. The boss was already in a deceleration for landing, and as the picture became clearer ,we could see the wind arrow indicated a tailwind. There was an ugly set of power lines off our nose. Why hadn't I got out the site diagram to review before landing? Sandbagging, I guess. The CC wasn't bothering to respond to me when I talked to him, so I guess I had decided "why talk at all?" Dumb decision.

LINK NINE

Whatever the reason, the result was the same I said "go around" just as he was making the same decision, and we struggled to get enough altitude to miss the power lines. We cleared them (closer than I like to think), but now what was the plan? Where was that tower? All these questions were going through my mind as the convoy commander (a second lieutenant) called us and told us that it was OK if we just went ahead and started into town, instead of waiting for his trucks to get on site. That made decisions a lot easier, as we now only had to continue our straight-ahead go-around and fly into town, about 12 miles ahead. We were now reduced to flying at about 50 foot above highest obstacle (AHO), above a set of power lines that we knew led to the end of the runway up ahead, and at most,we could see one and sometimes two poles ahead. The boss had me dial up the Automated Surface Observing System (ASOS), and the report was ludicrous. It said the aerodrome was sky clear, visibility unknown. Obviously the thing was broken, but that wasn't how the boss saw it. He actually responded this time when I said I would find the frequency for Center so we could coordinate for a special VFR arrival. He informed me that since the ASOS said it was VFR, we weren't going to coordinate for a special. Besides, it wasn't like anyone was going to be flying in the airspace anyway, right?

LINK TEN

We found the runway easily enough through the snow, flew down its length, taxied clear to a keyhole for refuel, and started shutdown. As I got out to catch the blades for tie-down, I heard the distinct and frightening sound of two jet engines being pushed up to full power as a corporate jet performed a go-around. Tim, the FBO fuels man, informed me that the Learjet was on its third attempt to break out, and he wanted to know what we were doing flying down the runway without coordination.

LINK ELEVEN

It made me pause when I realized we were very close to sharing living space with a Learjet, and I got mad. I finally told the commander in no uncertain terms that unless the weather improved I was not getting back in that helicopter. Don't you hate it when your words come back to bite you? It just so happened that the weather did get better (at least it stopped snowing), but the cloud deck stayed at 300 feet and showed no inclination of rising. While we were getting fuel, the commander received no less than four phone calls on his mobile from various members of the wing leadership, and with this in mind, he decided we would take off again and see how it looked. Now, where had I heard that before? Why I didn't point out that we were still violating the regulation because we didn't have a low-level route and Form 70 that would enable us to operate below 500 feet, I don't know. We couldn't make it back to the MAF because it was at a higher elevation than the town and was somewhere up in the clouds, so, we just circled at 100 AGL waiting to intercept the convoy. I remember that as we circled there, I kept making comments (in retrospect, cryptic comments) about mission planning and feeling the pinch, etc., but he was back in no commo mode. As the convoy proceeded through the town, we scouted the route up ahead and found ourselves following the road into a canyon.

LINK TWELVE

Now, we found ourselves 50 feet below the clouds and 50 feet AHO as we circled in this canyon, looking for threats and assessing the road conditions. We decided to get out of the canyon and find another way around to the backside of the hill. As we were exiting the canyon, we heard the lead fire team relay to the 2Lt convoy commander that there were vehicles on the side of the road putting on chains. The convoy CC asked if they were GOVs or POVs. The lead fire team relayed that they were locals, and the convoy CC (amazingly) decided that since they weren't GOVs we didn't have to chain up as well.

LINK THIRTEEN

Meanwhile, we had found a lower canyon that allowed us to duck under the clouds and come up on the backside, where we would again circle and wait for the convoy to appear. As the boss burned an orbit in the sky (I still hadn't been allowed back on the controls) we heard a terrified A1C broadcast over the net that he was losing traction on the payload transporter (PT) van and was sliding down the hill toward the 50-foot drop-off

in the canyon we had just left. The convoy CC ordered a HUMVEE to make contact with the back of the semi-trailer and stop it sliding, but luckily it didn't come to that (could you imagine doing the ground safety paperwork on that?) because the PT van stopped 18 inches from the ledge. The convoy CC asked the PT van driver if he could get going again. Never underestimate A1Cs, because this young man was the only person who made an intelligent decision that day, when he replied that he wasn't going anywhere until he had chains on his vehicle. This delay meant that we had a priority-one resource sitting at a dead stop on a public road, so we had to set up a National Defense Area (NDA). An NDA means that for a period of time, any property within the perimeter becomes a federal reserve and the military can now exercise the right to keep people out, even if they own the property. This is a touchy situation because it makes the resource more vulnerable to attack and it usually ends up costing the government money. So, there is a significant amount of pressure to get situations requiring an NDA over as soon as possible.

LINK FOURTEEN

Upon hearing the young A1C's frantic broadcast, we had immediately started a course reversal to duck back under the clouds through the valley, and arrived on scene. The scene just happened to be that box canyon where we were just circling at 50 feet AHO and 50 feet below the clouds. We started circling again and I was getting more than just a little nervous, so I made what I thought was a brilliant suggestion: "Sir, why don't we land?"

LINK FIFTEEN

There were two sizeable fields available (one with a small hill in the center) that would make excellent landing zones, but my boss remarked that we didn't have landowner permission to land. As a former security policeman, I knew that when you were dealing with an NDA, you didn't need landowner permission to do anything. You just did it and let Finance and the JAG deal with it later. I was getting ready to share this nugget of information with my aircraft commander, when he made a radio call asking the U.S. Marshal (one accompanied every weapons movement) to go up to the house next to the road and see if he could get landowner permission for us to land in their field. I watched in amazement as the Marshal put his truck into gear and drove up the hill and disappeared into the clouds. The boss, also watching our disappearing Marshal, remarked that he was "too old for this $%!#" and decided to land on the road.

LINK SIXTEEN

Let me describe our landing zone. It was a small, elevated dirt road that came down the hill, out of the clouds, leveled off for about 50 feet, made a small S-turn and then went down the canyon. A set of power lines proceeded down the left side of the road, jinked across the road right after the S turn, and then continued down the right side of the road. Of course, the only place to land on the road was in the middle of the S-turn so the boss directed me to "keep us clear of the power lines" and started a right turning approach to land, without briefing the crew as to what we were doing.

LINK SEVENTEEN

As we approached the ground, I split my attention between the power lines out our right door, the aircraft instruments (calling sink rate and power), and the snow cloud that we were kicking up and that was rapidly approaching our cargo doors. I continued to call out: "Clear of power lines, sink good, power increasing, snow at the cargo doors, snow at the cockpit doors, snow at the nose …." We were in a white-out. A white-out is a situation peculiar to the rotary wing community in which our rotor wash creates a swirling vortex of snow and places the crew in a zero-zero condition just above the ground. You try hovering the aircraft with no visual references and see how long you last.

LINK EIGHTEEN

I looked out my door and saw one rock sticking up out of the snow and announced three times that I had a hover reference. The commander didn't respond, so I assumed (you know what happens when we assume) that he had a hover reference. I felt the aircraft start to settle rapidly, and looking between my feet, I saw the edge of the road coming up fast. I immediately realized this meant we had one skid on the road and the other over the middle of a six-foot ditch. I called out, "STOP DOWN, STOP DOWN, STOP DOWN" as I reached for the collective, and we hit and started to roll.

LINK NINETEEN

For those of you unfamiliar with helicopters, it is important to understand that if the venerable Huey has a rolling motion, a pivot point, partial weight on its skids and passes 17 degrees of bank, there is no getting it back, and you suddenly find the aircraft on its side. A ridiculous amount of torque and full left cyclic stopped the roll at fifteen degrees, kept the blades from tangling with the fence line on the other side of the ditch, and started a rapid roll to the left.

LINK TWENTY

We came shooting up out of that ditch, still in a white-out condition, and started a climbing left slide. Remember where those power lines were? I sure did, and was determined to keep us out of them. Next thing I knew, the boss and I were fighting over the cyclic. He was pushing left cyclic to get us out of the ditch and I was pushing right to keep us out of the power lines. We both finally agreed to push forward cyclic and started a forward level acceleration. Where were those power lines again? Oh yeah, they jinked across the road, didn't they? They sure did, and as we cleared the white-out, there they were right off our nose crossing the road. We both were still on the cyclic and collective, and both pulled aft and hard right as the blades slapped the bottom of the power lines (without snapping them), and we began a rapid right slide in excess of 40 knots.

LINK TWENTY-ONE

Do you remember I said that one of the fields on this small level area had a small hill in the middle? Based on how this day had already gone, where do you think that hill was? Yup, right out the right door, and we were heading for it fast. We pulled max torque again as our right skid dug into the snow at the top of the hill, but didn't make ground contact. As we established forward flight down the hill, the boss made the statement that he had been feeling for the ground and couldn't see anything. I asked if he had heard the hover reference calls, and he admitted he hadn't. The only other words he said were, "That was stupid," and we returned to the S-turn—now dusted clean of snow—and landed safely. I got out of the cockpit to relieve myself (and cuss), and found two of four cops from the fire team we were carrying on their knees, vomiting in the snow. They knew we had come close to buying the farm.

USA Photo by SSgt Brian W. Schlumbohm

AFTERMATH

Later the boss refused to talk about it and didn't take time to debrief the mission. I approached my supervisor and the chief pilot to discuss the situation, and received some of the best instruction in aviation and officership I have ever had. The chief pilot didn't make excuses for the boss, but didn't bad-mouth him either. He sat me down and reconstructed all the things that went wrong that day. He used the links in the chain method I used above and showed just how many times we came close to eating it. He helped me understand what was happening behind the scenes (like pressure from the wing leadership, frustration and pride) that created the "get the mission done no matter what" attitude we encountered that day. During our conversation, my eyes were opened to a world far more complicated than my previous little co-pilot existence.

This wise old pilot asked me what kept us from crashing. I confidently replied that a rapid recognition of the rolling motion and our subsequent torque application saved the day. He immediately disabused me of my illusions, by saying that our survival was nothing more than dumb luck. I was thankful that he went further and said, "Next time, don't get to the point where you need dumb luck to save you." He went and talked with the boss and made sure he also knew it was dumb luck that had kept us, and our fire team, alive.

He also took me to task for my rotten performance as a crewmember. I will never forget what he said. To sum up, it contained the following nuggets of wisdom:

1. When you got in that aircraft, you were not just the co-pilot or the junior lieutenant in the squadron, you were a member of the crew. The commander was counting on you just as much as you were counting on him.
2. When in doubt, speak up. Be an active follower, and not just a sandbag.
3. Don't be vague with your concerns. Be direct and specific.
4. If someone doesn't respond to your input, reach over and make physical contact to see if they are with you.
5. The rules are there for a reason. Don't ignore them or find ways around them. Follow them.
6. Never be afraid to say no to a mission (even if pressured) if it is the right call.

He was right about all of the above, and the chain that dumb luck finally broke will never let me forget the lesson.

St. Elmo's Fire

CAPT JONATHAN THOMASSEE
8 FS
Holloman AFB NM

USA Photo by MSgt Timothy Landcaster

Ask any fighter pilot about flying at Hill AFB during the winter, and St. Elmo's Fire will surely come up in the conversation. When the conditions are right, this spectacular phenomenon provides a light show in the cockpit second to none.

In 2002, as a new wingman at Hill, I had my first experience with these electrical discharges during an NVG sortie. As our two-ship entered a snowstorm, I immediately noticed something abnormal was going on. Having never seen or heard of St. Elmo's Fire, I first suspected a malfunction of the NVGs. Much to my dismay, when I lifted the NVGs there were small lightning bolts dancing across the top of my canopy. My first reaction was to lower my seat and remove my NVG bracket. I wanted as much distance away from the canopy as possible! After a quick radio call to Lead, I was assured that this was a normal thing and nothing to worry about.

He was right. St. Elmo's Fire is usually harmless, providing at worst a light static shock to the pilot. As I soon found out, however, this light show was just a warning sign for the real danger—lightning.

The phenomenon is scientifically known as a *corona* or *point discharge*. You've seen it many times before, since it is almost exactly the same as the glow found inside fluorescent tubes, mercury vapor streetlights, old orange-display calculators, and in "eye of the storm" plasma globes. When it occurs naturally, we call it St. Elmo's Fire, but when it occurs inside a glass tube, we call it a neon sign. It occurs on objects, especially pointed ones, when the electrical field potential strength reaches about one thousand volts per centimeter. During fair weather, the electrical field strength of the atmosphere is about one volt per centimeter. In the initial stages of cumulonimbus (thunderstorm) formation, however, the field increases to five volts per centimeter, and just before a lightning flash it reaches 10,000 volts per centimeter. Thus, the atmospheric electrical field is only strong enough, under normal circumstances, to produce St. Elmo's Fire during lightning-producing weather. When the storm is particularly heavily charged, leaves, blades of grass and even the horns of cattle may glow at their tips. The glow of St. Elmo's Fire has often been observed on sharp objects in the vicinity of tornadoes.

St. Elmo's Fire also forms on aircraft flying through heavily charged skies, often as a precursor to a lightning strike. The glow can be seen concentrated on wingtips, antennae, the tail and nose (as in the case of the F-16), when the potential difference is large enough. St. Elmo's Fire can also be heard "singing" on the craft's radio, a frying or hissing sound running up and down the musical scale. This is a very good indication that a full lightning discharge is about to take place.

Armed with this new knowledge, I began my second winter at Hill as a flight lead. One night in the conditions were ripe for St. Elmo's Fire and the associated thunder/snowstorms. I briefed my wingman about the hazards of thunderstorms and how we were going to avoid them that night. *Not* to my surprise, he had never seen St. Elmo's Fire, and was a bit apprehensive. Soon after departure, we received weather warnings from Salt Lake Center about a thunderstorm building along our route. With my wingman in radar trail, I began to get vectors around the storm. Before long, we entered the clouds and the light show began. This was by far the most intense corona discharge I had ever seen. Streaks of lightning extended for the full length of the canopy. I was very impressed, but my wingman was not. As we continued our climb, Number Two had a few more questions about the intensity of the phenomenon. We exited the electrically charged cloud and climbed above the freezing level. Having successfully avoided the foul weather, we were able to look back at the thunderstorm we had just avoided.

What goes up must come down, but how that object comes down is the art pilots must learn--the art of landing. As a young pilot, I have heard over and over about landing on speed, on centerline. Those items have always seemed like a given to me, but you never realize how important they are until things get a little hairy in the landing phase. When flying with other pilots, I notice no one ever lands exactly on centerline or airspeed. So, what is an acceptable amount of deviation? Before the incident I describe here, I would have said maybe 10 feet either side of centerline was acceptable in my airframe. As far as airspeed, I would have said zero knots slow to 10 knots hot was an acceptable range, still safe and within limits. My view on those parameters has been reduced to "on speed and on center" due to the following set of circumstances.

The mission started off like any other training mission I have flown in my four years of aviation. Part of the profile always includes about five to 12 landings, depending, on the approaches flown. On this sortie, I was transitioning from the right to the left seat and found myself landing left of center on almost every landing. The IP explained that was normal in most upgrading pilots, because of the different sight picture from different seats in the airplane. So, I accepted that I would probably be a little left of centerline until I got my sight picture down in the left seat.

That's where the problem began. I accepted the slight deviation, instead of correcting it and not allowing it to occur. As on most winter days in Europe, the weather was gradually changing for the worse, and training was getting limited. We checked the weather at Bodo, Norway, and launched to get a couple of approaches in before nightfall and before heading back to base. It was my leg and it was about a two-hour flight up to Bodo, so we talked about the earlier flight and covered some general knowledge for the upgrade process. As we got closer to the airport, we could see the cloud cover was thick, and we updated the weather to get a current report.

The weather was below VFR, but above our minimums for the ILS we needed to fly into the airport to get gas. The weather was calling for moderate snowfall, about three miles visibility, and braking action around 12 for wet runway. We descended into the airport for the approach, and as ATIS said, we were surrounded by snowfall in full IMC conditions. We reported established on the ILS and followed it down to about 400 AGL before breaking out to a black runway outlined by white snow as far as you could see. I had never landed in these conditions before, so I was definitely on my instruments until we were over the approach lights. The approach was flown about five knots fast and the touchdown was the best I had ever had—smooth as silk, but about seven feet left of center with a 10-knot crosswind helping me move in that direction.

What I didn't realize was that the landing was smooth because we touched down on an icy mix that was actually about a braking action of six at the most. The airplane began to drift more to the left, so I applied a little right brake to compensate. This is where the "fun" began. The airplane began to slide to the right, just like a car on ice. So, I took that brake pressure out and put in a little left brake to straighten us back up. Now we were straight, but still seven feet left of center and being pushed to the left by the wind. Every time I tried to bring the aircraft back to centerline, the skidding would occur, resulting in a not-so-advantageous landing rollout position. Finally, after about 1,500 feet of playing this game, we hit solid ground and the tires gripped the asphalt, allowing me to bring the aircraft back to centerline, apply brakes and thrust reversers (TRs).

The rest of the way down the runway, the adrenaline was pumping so fiercely that I couldn't even talk to the other guy. He kept telling me that I could use the TRs, but all I could do was focus on bringing this aircraft to a stop, and getting off the active so I could breathe. The IP was used to flying in these conditions and was as calm as could be, but asked me just one question when we cleared the active: "Why is it important to land on centerline?" I smiled at first, but the reality set in and I got his point. If I would have landed on centerline, we would not have started sliding, trying to correct back to centerline. This situation could have been prevented by landing on centerline, and not accepting that small deviation landing slightly left of center.

You don't train for those ceiling-and-visibility-OK, VFR, and clear-and-a-million conditions; you train for conditions like the ones we had just encountered. So when you are out flying and you land a little off centerline or a little off airspeed, ask yourself, "What if there was a crosswind, or a wet runway, or a 70-foot runway, or an icy runway? Would I allow for that margin of error?" The answer should be, "No," and this should create a new vision of professionalism in your flight discipline. Yeah, five feet off center or 10 knots fast might be safe today, but on that icy runway it was the cause of a preventable hairy situation. My outlook has changed due to my scenario. I strive for on airspeed and on centerline. I hope it has inspired you to accept no deviation in your own performance, even if it is within limits.

FY07 Aviation Mishaps
(Oct-Nov 06)

5 Class A Mishaps (3 Flight)
0 Fatalities
0 Aircraft Destroyed

FY06 Aviation Mishaps
(Oct-Nov 05)

4 Class A Mishaps (4 Flight)
0 Fatalities
0 Aircraft Destroyed

02 Oct ✈ A C-21 departed runway near approach end and caught fire; crew egressed safely.

02 Oct An F-15E had multiple bird strikes; damage to # 2 engine and left wing.

26 Oct ✈ An F-16C caught fire on takeoff; pilot aborted and egressed safely.

- 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 all fatalities associated with USAF Aviation category mishaps.
- "✈" Denotes a destroyed aircraft.
- "✶" Denotes a Class A mishap that is not in the "Flight" category. Other Aviation categories are "Aircraft Flight-Related," "Unmanned Aerial Vehicle," and "Aircraft Ground Operations".
- Air Force safety statistics are updated frequently and may be viewed at the following web address: http://afsafety.af.mil/stats/f_stats.asp
- **Data includes only mishaps that have been finalized as of 16 Dec 06**.

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Fuel means time,
time means options,
and options are good.
See page 18