



Freezin's the Reason!

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Last January and February we endured minus 20 degrees Fahrenheit almost continuously. If you arrive here from south of the Mason Dixon line in January, it's probable the temperature difference may be as much as 70-100 degrees. You're probably going to step out of your jet in your summer weight jacket, leather flight gloves, and summer weight boots onto the DV pad where you parked at Minot. The DV spot to base ops is about 40 yards away, and as you bravely walk those 40 yards to activate your next flight plan, you stand a good chance of receiving frostbite on your hands, nose, ears, and possibly your feet. If you were wearing your long johns (yeah right), it will be pain like you have never felt before as your body attempts to thaw out. Frostnip and Frostbite are alive and well and still regularly kick our collective hind ends here at Minot, and if the wind is blowing, let's just say it will really suck to be you.

Driving in snow and ice is not like driving on wet roads, it's two orders of magnitude worse. "But," you say, "I have a 4 wheel drive vehicle." Up here, the number of wheel drive you have only accounts for the total number of wheels taking you to the crash site on windy, icy highways. Drive slowly, use your hazard lights, and use the road as a reference. Last winter we had five vehicles, one after the other, drive off the road because the first person in line went into the ditch and the others stopped navigating, and just followed him in. Going off the prepared surface in the north in the winter is baaaadddd on oh so many levels. I've had three tours up north and 4.5 years as a kid in Alaska, so I'm not making this up.... - Lt Col Kevin P. McGlaughlin

Photo by SSGT Jocelyn Rich

For some, cold weather means you bring a light jacket with you when you go out at night, but for those who know, it's when snow squeaks when you walk on it, and motor oil turns to molasses and water freezes before it runs off of the hood of a car. We're talking below freezing, and beyond! You're reaction may be, "well that's why I chose a southern base, so I wouldn't have to deal with the cold or worry about it." With an attitude like that, Ol' Murphy will be chomping at the bit to spank you the first chance he gets. Ever heard of COPE THUNDER, or divert? If you have, then listen up, because cold weather plays havoc with the flying mission, but protecting freedom doesn't take a vacation, so all you can hope to do is cope, and minimize its effects.

Technical assistance for this article came by way of the fine folks at the Minot AFB Safety Shop; who better than the "Frozen Chosen" to ask about winter flying ops? We poke fun, but they endure and still perform the mission under some very hostile conditions. The items discussed in this article are by no means all inclusive, they are provided as general guidelines for thought and discussion, and always follow your aircraft tech order and local operating procedures. Smooth winter ops are possible, and prior planning pays the biggest dividend.

Mission Planning

Adapting a motorcyclist's mantra of "dressing for the crash," flight crews should "dress for the walk home," in that if you eject or crash land, you're only going to have what you are wearing at the time or what you took with you. Cold weather gloves, jackets and insulated flying boots combined with thermal underwear will keep you warm during a flight and can save your life in an emergency. In extreme cold weather, consider using a neoprene face mask. It not only protects against wind burn and frostbite, but it also keeps you from breathing in super-cooled air. Other items to consider carrying with you are a divert kit including mission planning forms, clothes, and a shaving kit. Don't forget extra money or your Government Travel Card. Carry it with you on every sortie. Refer to ACCI 11-301 for additional items and requirements.

While mission planning, take a good look at all of the approaches for your potential divert bases, and check for any applicable Notices To Airmen

(NOTAMS). Ensure you understand the requirements to fly each approach, as well as the lighting and runway environments, and consider approach and landing procedures for low visibility landings. Consider the mission impact from snow and ice-covered taxi and runways, crosswinds and icing conditions for takeoff and landing. While prepping for the flight, discuss as a crew or flight procedures concerning landing on ice and slush-covered runways and the maximum crosswind for your aircraft weight and configuration. Consider fuel reserve requirements when choosing weather or emergency divert airfields, and always have a landing alternate designated on your filed flight plan, and several more in your "back pocket plan."

Crew Show

Anything can go wrong and everything takes longer during the winter months, so build in a time pad and allow extra time to do everything starting with your show time before the flight. Review the weather and request the temperature and dew point spread for both takeoff and landing, as it will impact your anti-ice procedures. While you are at the weather shop, request weather for a suitable takeoff and landing alternate (annotate takeoff alternates in the remarks section of the DD Form 175 Flight Plan). Prior to stepping to the jet, review taxi and runway conditions and snow removal efforts. Allow adequate time from notification to completion of aircraft snow removal/deicing operations, and check with the Supervisor of Flying (SOF) to ensure it has been completed before stepping to the jet.

Preflight

Once at the jet, ensure all snow, ice and frost are removed from wings, vertical fin, horizontal stabilizers, windscreen and around all pitot-static system probes and ports. Failure to remove snow from the fuselage before applying interior heat will result in ice re-freezing on the fuselage, causing drag and possible erratic airspeed indications if it forms around the pitot heads or static ports. Make sure all ice is removed from inside the engine inlets as ice can be ingested into the engine through the air inlet, creating a Foreign Object Damage (FOD) hazard and damage to the engine.

Engine and Air Ground Equipment (AGE) such as aircraft heaters and air

cars are harder to start as the temperatures drop. At colder temperatures, starting times may exceed starter duty cycle limits or become impossible. During below zero temperatures, consider preheating the engine for 1 to 2 hours to increase starter performance and reliability. Once started, allow the engine to warm for a minute or two to allow the oil pressure to stabilize, (high or low oil pressure conditions may both be encountered on engine start in extremely cold weather, but should drop to normal pressure within 2 minutes) provided some indication of oil pressure is observed; up to 3.5 minutes may be allowed for the oil pressure to reach the minimum limit. During ground ops prior to taxi, ice build-up can form on the engine inlet components during extended ground operations at idle power settings even though the anti-ice is on. Periodic run-ups to a nominal 80 percent rpm for 10-20 seconds at 10 minute intervals can minimize ice buildups (B-52). There are usually warm-up times for instruments, flight controls, hydraulics, accessory cases, etc. Engines usually idle slower and are sluggish to respond until they warm up. Be familiar with your tech order operating limits before you call with a maintenance problem.

Taxi

Time is your greatest asset: give yourself and your formation plenty of time to get to the runway, and make sure all instruments have warmed up sufficiently to ensure normal operation. Check for sluggish instruments during taxi. Avoid taxi delays; identify potential snow and ice hazards early and resolve them. On ice and snow covered areas, taxi speed should be reduced and the normal interval between aircraft should be increased. Snow covered taxiways and runways present a variety of problems while taxiing. Taxiing through deep snow should be avoided as taxiing and steering are extremely difficult and frozen brakes and gear may result. On very slick surfaces, come to a complete stop prior to turning and monitor wind gust and crosswinds as they can push you off of your taxi line. If taxi lines are not visible from the cockpit, plan to have them swept/marked and clearly

visible before taxi. Above all, if you don't think it is safe to taxi, then DON'T.

Takeoff

As general rules of thumb, do not takeoff: until all ice and snow have been removed from the aircraft, under conditions of freezing rain or freezing drizzle (AFI 11-202V3, ACC SUP 1). If you have been taxiing under conditions conducive to icing, do a static run-up prior to takeoff to assure normal engine operation. Signs of engine icing could include loss of power, abnormal or slow RPM response to throttle movement, and indications of engine surge or stall. Takeoffs should also not be attempted when runways are covered by water and/or slush in excess of 0.3 inch depth. If an abort is attempted under such conditions, hydroplaning, which will cause severe control and braking losses, may occur at higher ground roll speeds. When taking off from a slushy or wet runway, consider leaving the gear down approximately 30 seconds without braking after takeoff to allow moisture to be blown from the gear. Gear retraction will take longer.

Cruise

Icing conditions which lead to the use of the engine, nacelle and scoops anti-icing system at altitudes above approximately 25,000 feet should be avoided if possible, and known or suspected icing conditions should be avoided (flight above 250 KIAS with the true Outside Air Temperature (OAT) below 32 degrees Fahrenheit (0 degrees Celsius) and visible moisture (rain, wet snow or fog with visibility 1 mile or less) present). Following are a couple of JP-8 fuel considerations during high level cruise: avoid flying at altitudes where the OAT gauge is within 8 degrees Celsius (14 degrees Fahrenheit) of fuel freezing temperature (JP-8 freezing temperature is -47 degrees Celsius (-53 degrees Fahrenheit). Additionally, due to its poor cold weather volatility, air restarts are more successful when attempted within 10 minutes of engine shutdown (before engine cool down). When flying at high altitudes (over 35,000 feet, and low OATs), JP-8 has a tendency to thicken and gel when OATs get low, especially in aircraft with wet wings. Consult your aircraft tech order, you may have an ops limit.

Descent

During night flights, an inadvertent encounter of icing conditions or unobserved ice build-up is more likely to occur. Therefore, whenever there is any indication or suspicion that icing conditions may exist, turn on the anti-icing when below 20,000 feet and the OAT gauge reads below 10 degrees Celsius. Check weather conditions as soon as entering the local traffic pattern and get updates on a regular basis for your primary and alternate landing base if the weather begins to deteriorate.

Approach and Landing

The approach and landing begins when you are approximately 20 to 30 minutes from your start descent point. Update the weather as soon as possible, compute landing data, and decide if you will continue the approach or set up an orbit and wait for conditions to improve. If you decide to wait, get an area clearance, it's easier than holding. Fly your orbit at your best endurance airspeed at an altitude that doesn't take long to descend for the approach. Reference the Flight Information Handbook (FIH) Temperature Correction Chart when the temperature is below 0 degrees Celsius. Altitude corrections should be made to all approach altitudes inside the final approach fix to include decision heights, decision altitudes and minimum decent altitudes (at -35 Celsius with a Height Above Terrain (HAT) of 200 feet, you will have to add 50 feet to your published decision height on the approach plate). While flying practice approaches in deteriorating weather conditions, keep your divert fuel in mind. Don't let the field get socked in with early morning fog or a de-

creasing ceiling when you no longer have enough fuel to get to your divert base.

When on approach and landing, long, flat, unbroken stretches of snow make depth perception difficult, and the tendency is to overestimate the aircraft altitude. Likewise, a runway with just the centerline cleared of snow will appear narrower, causing pilots to overestimate altitude, resulting in late flares to landing. Under low ceiling/visibility conditions, avoid the tendency to "duck under" while transitioning to a visual landing. If you attempt to establish a visual profile similar to the one you see on a normal approach with good visibility, you will tend to aim at a spot short of the runway. This will result in a high sink rate and may cause an undershoot or hard landing (AFMAN 11-217, page 135). With crosswinds and blowing snow, it is possible to have a blizzard on the runway and be completely unable to see it in the flare. On the approach, the weather will look good, but as you enter the flare, you will encounter whiteout conditions.

When landing with a crosswind or slippery runway, compute the maximum crosswind component for your weight and runway condition, and be aware of aircraft restrictions for touch and go landings. As with takeoff, care should be exercised when landing on water and/or slush in excess of 0.3 inches. Hydroplaning may occur which will cause severe control and braking loss. Treat the last 2,000 feet of the runway as if it were icy when wet. Slow down to a very slow speed before entering the area of the runway and start all turns at a very slow speed or from a stop. To avoid skidding, slow your speed well before reaching the end of the runway where the rubber deposits are heaviest. 



Courtesy Photo