



Aviation Winter Weather 2020



After dodging thunderstorms for most of the summer, it will soon be time to transition to the fall and winter months. While fall and winter offer an escape from the oppressive heat and humidity of summer, they present their own set of aviation hazards. We will talk about those hazards in this article: turbulence, icing, fog, and severe weather.

Turbulence

Turbulence is caused by sudden, irregular movements of air that create sharp, quick updrafts and downdrafts. These updrafts and downdrafts work together and move air unexpectedly. The two basic types of turbulence that are most likely to affect helicopter pilots are thermal turbulence and mechanical turbulence.

Thermal turbulence: Thermal turbulence occurs when the surface heats up. As the sun heats the surface, the warm air rises. Uneven surface heating and the cooling of air that has already risen cause downdrafts. Sometimes these updrafts and downdrafts are confined to the low levels and are not a big deal. Other times, if certain ingredients are present, these vertical motions create cumulus clouds that may eventually develop into a thunderstorm, which is a big deal. It goes

without saying that in and around thunderstorms, turbulence will be severe to extreme, so I will not belabor the point.

Thermal turbulence usually occurs from SFC-100 during the late morning through late afternoon hours, when surface heating is at its peak. The result of thermal turbulence is generally a light chop that may affect lighter aircraft on takeoff and approach or low-level routes. In desert regions, however, thermal turbulence may be stronger, since heating there is greater.

Mechanical turbulence: Mechanical turbulence is caused by wind shear, both horizontal and vertical. The most common culprits are pressure gradient, terrain, and frontal zones.

In an area of high pressure, the winds are generally light. In fact, in the center of a high, winds are nearly calm. But in and around a low-pressure



Lenticular Cloud



Cap Cloud



Rotor/Roll Cloud

system, winds are stronger. The difference between atmospheric pressures is known as the pressure gradient.

On a surface weather chart, isobars are lines that connect areas of equal pressure. Wind speed is directly proportional to pressure gradient. When the isobars are packed tightly together, we say that the pressure gradient is tight and the wind speeds are higher. When the isobars are packed more loosely, there is a loose pressure gradient and wind speeds are lower. Therefore, you would expect to encounter some turbulence in areas where a tight pressure gradient exists and around areas of low pressure.

Terrain features, such as mountains, can also produce or enhance turbulence. Even subtle variations in terrain can affect wind speed or direction. In mountainous regions, the mountains can serve to channel or funnel winds. Mountain wave turbulence can be a big concern in these areas. Some telltale signs of mountain wave turbulence are lenticular clouds, cap clouds, and rotor/roll clouds. These clouds are cool looking but should be avoided!

Turbulence is also found in and around the frontal zones. As the warm and cold air masses interact, the warm air rises over the cold air. These vertical motions create shear, which can cause turbulence. Behind a cold front, expect to find turbulence due to the gusty winds behind the front.

Turbulence is classified by intensity and can occur in a cloud or in clear. The levels of intensity are light, moderate, severe, and extreme. Table 1 summarizes each of these intensities in terms of the effects on altitude/attitude, change in airspeed, and where you might encounter it.

All turbulence is not created equal; different types of aircraft have different sensitivities to turbulence. The effects of turbulence for rotary-wing aircraft depend on several factors such as aircraft weight, amount of fuel and/or cargo on board, lift velocity, airspeed, and an arc of the rotor blade. It is important to remember that the turbulence forecast in TAF code (the 5-group) is for Category II aircraft (gross weight $\geq 12,500$ lbs.). For a list of military aircraft by category, visit https://weather.af.mil/afwws_data/IMT/files/external/TURBCAT_tables.pdf.

Turbulence Intensity	Change in Airspeed	Change in Altitude/Attitude	Where Found
Light	5-14 knots	Slight, erratic changes	- Mountainous areas - In/near cumulus clouds - Low altitudes in rough terrain (low wind speeds)
Moderate	15-24 knots	Moderate changes, but pilot is in control	- In and around towering cumulus clouds (TCUs) and thunderstorms (CBs) - Low altitudes in rough terrain (high wind speeds)
Severe	≥ 25 knots	Abrupt changes; some loss of pilot control	- In and around mature thunderstorms
Extreme	≥ 25 knots	Violently changes; pilot has no control	- In and around severe thunderstorms and squall lines - In mountain waves near rotor or lenticular cloud

Table 1: Summary of turbulence effects on aircraft (Air Force Handbook (AFH) 15-101)

Icing

In the mid latitudes, icing is most frequent during the winter months. This is in large part because frontal systems are more numerous during this time.

We classify icing by amount or intensity. The four icing intensities are trace, light, moderate, and severe. Trace icing is when icing first becomes noticeable. It generally does not pose an operational hazard unless it lasts for an hour or longer. Light icing occurs when icing conditions persist for more than an hour. Accumulation continues and can become problematic for the aircraft. With moderate icing, the rate of accumulation is greater, and even brief encounters can be hazardous. The use of de-icing equipment is necessary. When the rate of accumulation is great enough that de-icing equipment does not reduce or control the icing, you have severe icing. Severe icing is an extremely hazardous situation, and if you ever encounter it, you should immediately divert.

Icing increases the weight of the aircraft, but more importantly, it disrupts the smooth flow of air, increasing drag while decreasing the ability of the airfoil to create lift. One type of icing, induction icing, can even interfere with the power of the aircraft's engine (carburetor icing).

Icing is described in terms of type and intensity, or amount. The five types of icing are clear, rime, frost, mixed and induction. The temperature, water droplet size, and cloud type determine the type of icing that will form. Table 2 summarizes the types of icing and their characteristics.

Freezing rain, like most icing, occurs near fronts and low-pressure systems. Water droplets become super-cooled as they fall through a sub-freezing layer of air and freeze upon impact. Freezing rain or freezing drizzle implies severe clear icing. This icing accumulates rapidly, so if you are unfortunate enough to encounter it, you must act quickly to get out of it.

Fog

Fog forms by increasing the moisture of the air and/or by cooling the air. Moisture may be increased by precipitation, evaporation from wet surfaces, moisture advection, or sublimation from a frozen surface. Cooling the air may be caused by radiational cooling, advection over a cold surface, upslope flow, or evaporation.

There are six types of fog: radiation, advection, precipitation-induced, upslope, freezing, and ice. Due to space and time constraints, I will only hit the highlights.

Radiation Fog: Radiation fog is a relatively shallow fog resulting from radiational cooling of the ground on clear, calm nights. The ground cools the air in contact with it to the dew point temperature, producing fog. It almost always forms at night or in the early morning hours and generally burns off shortly after sunrise. If winds are light, that can actually worsen the fog.

Advection Fog: This is common along coastal areas, advection fog forms when moist air moves over colder ground or water. When this occurs over the ocean, it is known as sea fog. Advection fog

Type of Icing	Outside Air Temperature Range	Type of Cloud	Characteristics
Clear	Between -8 °C and -10 °C Between 0 °C and -16 °C	Stratus Cumulus	Large, super-cooled droplets slowly freeze and spread over the surface of the aircraft; glossy, clear or translucent appearance
Rime	Between -10 °C and -20 °C Between 0 °C and -30 °C Between -8 °C and -10 °C	Cumuliform Stratiform Stratus	Small, super-cooled droplets quickly freeze, trapping air beneath pockets of ice; milky, opaque appearance
Frost	Below 0 °C		Forms when water vapor comes in contact with a subfreezing surface; can occur in flight or on the ground; light, feathery appearance
Mixed	Between -10 °C and -15 °C	Stratiform or Cumuliform	Forms when water droplets are different sizes or when water droplets are mixed with frozen droplets
Induction	Between -3 °C and 3 °C	Any or none	Forms when super-cooled water droplets are pulled into the engine of the aircraft, blocking air flow; aircraft suffers power loss

Table 2: Summary of the types of icing



can linger over water for weeks, advecting over land during the day. The west coast is vulnerable to advection fog, as is the Gulf Coast.

Precipitation-Induced Fog (aka Frontal Fog):

Frontal fog forms when relatively warm precipitation falls through cooler, drier air, causing it to become saturated. Post-frontal fog is associated with cold fronts, is found behind cold fronts, and can be persistent and long-lived.

Upslope Fog: If you have ever lived or flown in mountainous terrain, you know all about upslope fog. Moist, stable air cools as it is blown up sloping terrain and forms upslope fog. It can be dense and extends to high elevations. Upslope fog usually forms at higher elevations and then builds downward into the valleys. Upslope fog will persist until the wind shifts to a less-favorable fog producing direction.

Freezing Fog: Freezing fog is similar to freezing rain. Super-cooled water droplets (i.e. fog) remains in a liquid state until coming into contact with a freezing surface. When that occurs, the fog freezes, and you get freezing fog.

Ice Fog: Ice fog only occurs in very cold temperatures (< 30 degrees Fahrenheit). It is composed of tiny ice crystals that are suspended in the air.

Each of these types of fog is different, but

each can affect aircraft operations. Fog can be tricky. Many locations have rules of thumb to help forecasters determine the onset and duration of fog. Understanding the weather pattern is crucial for a good fog forecast, and a look at a Skew-T diagram does not hurt either!

Severe Weather

Severe weather can occur during any season. For many parts of the country, fall is the second most severe weather season. Why? Simply put the collision of air masses. When warm, moist air meets cool, dry air, the potential for severe weather exists. Severe weather is possible during any month and at any time of day if the conditions are right. So even though we are going into the fall and winter months, do not let your guard down!

Conclusion

Several fall and winter hazards exist, and most of them are associated with frontal boundaries, low-pressure systems, and terrain. Turbulence, icing, fog, and severe weather can turn a routine flight into anything but routine. Be wary and watchful for all of these winter weather woes. And above all, stay healthy and safe! ■

Cindy Howell
Supervisory Meteorological Technician
OL-C, 18th Weather Squadron
Fort Rucker, AL

Dust, Sand, and Snow Operations: Prepare for It



Dust, sand, and snow operations prove to be demanding for Army aviation crews when encountered. The ability to successfully complete rotary-wing operations supporting ground forces whatever the geographic location and environmental conditions require aviation crews to be prepared for the most demanding of these. As degraded visual environments (DVE) habitually created during dust or snow operations continue to be a leading cause of mishaps, it is important that Army aviation crews thoroughly understand the environmental considerations, then plan, rehearse, and train to operate in these environments.

Considerations

The specific aircraft aircrew training manuals (ATM) provide information on what considerations should be accounted for when operating in conditions with dust or snow and the possible DVE implications. The ATM specifically addresses considerations under the "Crewmember Task"

section. An example follows from an excerpt from the UH-60 Crewmember Task section:

"5. Considerations. This section defines consideration for accomplishing the task under various flight modes—for example, night, NVG, environmental conditions, snow/sand/dust and mountain/pinnacle/ridgeline operations. Crewmembers must consider additional aspects to a task when performing in different environmental conditions. Including environmental considerations in a task does not relieve the commander of the requirement for developing an environmental training program IAW TC 3-04.11. Specific requirements for different aircraft series or mission equipment (H-60M, ERFS, Volcano, and so forth) may also be addressed as a consideration. Training considerations establish specific actions and standards used in the training environment."

For each aircraft, the ATM will address the particular considerations based on the aircraft, mission and systems. The key is the standards section ensuring they provide the commander with

the necessary training program designed to support environmental training that prepares crews to perform in dust/sand/snow conditions.

Plan

Once the unit environmental training program has been developed and the appropriate considerations for dust/sand/snow have been incorporated, the unit standardization section can proceed with planning the flight training program to bring aircrews to a trained status.

Planning for training environmental conditions may be troublesome for units that are located geographically removed from the conditions such as dust/sand/snow. Units operating in certain geographies will have to rely heavily on simulators to produce the conditions they are training their aircrews to operate in. Typically unit locations will have at least one of the conditions naturally occurring whether that be dust, sand, or snow. For other conditions, the unit plan may require crews to deploy to a location that supports the training conditions.

There is no substitute for the actual, recent in-aircraft training experience. Whether crews are very experienced from past operations in the environmental conditions, the training is to be conducted in, studies from the United States Army Aeromedical Laboratory (USAARL) have shown that when pilots are re-engaged to operate in conditions

which they have experience in, but not recently, there is a high demand cognitively to “re-learn” how to accomplish the task. This is visible in data which shows an increase in mishaps when units first deploy to a new theater of operations/geographic area and encounter different environmental conditions.

Rehearse

Rehearsals are required. The ability of the aircrews to rehearse the mission is so important to work out the bugs in the plan prior to actually conducting the training mission, in this case. The rehearsal will allow the commander and standards section instructors to witness the aircrews working through the training scenario. This proves beneficial to building confidence in the crews by getting it right the first time (the law of primacy) they fly the scenario in the simulator.

Rehearsals should step through aircrew actions and indications while single ship and move to more advanced operations conducting multi-ship formation operations in environmental conditions of dust, sand, and snow. The rehearsal of multi-ship operations should help to formalize the unit standard operating procedures (SOP) on what pilot actions are when there is a go-around call, or for more demanding situations where several aircraft have made a landing in DVE conditions while several other aircraft have performed a go-around. Rehearsals should introduce dust or snow clouds





obscuring the landing zone (LZ) to create a situation where the unit SOP must detail what chinks who couldn't make it into the LZ do. The time to figure out the SOP for multi-ship is during the rehearsal and not during the in-aircraft portion of the training mission.

Train

Once the rehearsals are completed, the aircrews should be ready to begin the crawl, walk, and run process beginning in the simulator. The aircrews should go through the planning, risk management, and mission briefing just as in any other mission. The unit standards section should have situational training exercises (STX) planned which crews are worked from less demanding conditions to the most demanding single-ship followed by the most demanding multi-ship in aircraft STX.

By the run phase of the training program, crews should be able to competently perform their mission in the most demanding dust, sand, and snow environmental conditions. The unit SOP should be well defined for operating in these conditions both single-ship and multi-ship leaving no question as to what crew actions are for situations such as DVE, spatial disorientation, or actions during go-arounds and LZ obscuration.

Conclusion

Dust, sand, and snow environmental conditions are some of the most demanding and hazardous for Army rotary-wing aviation crews! Data has shown that when aircrews enter a new theater of operation/geographic area, historically mishaps have increased. For crews to overcome this threat to operational safety and mission (even crews with previous experience in the conditions) requires units to integrate dust, sand, and snow training programs which bring recency to experienced crews and initial training for those less experienced.

Providing a training program that incorporates the ATM considerations into the planning, rehearsal, and hands-on simulator and aircraft execution will bring your aircrews to the trained level. Along with crews achieving the trained level, units can update and validate their SOP for typical events encountered during operations in a very hazardous DVE susceptible environment. ■

Aviation Division

***Directorate of Assessments and Prevention
U.S. Army Combat Readiness Center***

FARP Planning and Safety Isn't Just another Paper Work Drill

Have you ever been asked to inspect and safe a forward arming and refueling point (FARP?) Have you always assumed that conducting this inspection was the responsibility of the aviation safety officer (ASO), or were you unaware that a FARP is required to be inspected before ammunition (ammo) and fuel is loaded onto helicopters? Maintenance may be the backbone of Army aviation, but a well-planned and operating FARP is the life blood that keeps our aircraft in the fight. Aircrews may see the FARP as just another place to grab some ammo and a splash of gas, but the FARP is a high stress and dangerous area of operation having the potential for catastrophic events if not respected.

Planning

Commanders and staff planners should consider the following variables of mission, enemy, terrain and weather, troops and support available- time available, civil considerations (METT-TC) when determining FARP locations. The FARP should meet the unit's mission requirements, provide support throughout the battlefield and avoid threats from observation and engagement from the enemy. Location and site selection can make or break a unit's FARP. Key planning details such as predominant winds to determine landing and takeoff directions in addition to communications should not be overlooked when planning the layout. Do not just look at a map and say that is a good location. When able, walk the grounds to assess the conditions. During the planning phase, ensure that adequate land space is considered based on the size and number of aircraft that the FARP will support. Once



the optimal location is selected, publish the FARP card dictating the layout, communication plan, and landing/takeoff instructions.

Consideration must be given to who the planner is for the FARP. At times non-aviation personnel, such as logisticians, may be charged with planning an aviation FARP. When this is the case, commanders should ensure the proper oversight utilizing the aviation safety officer and other aviation professionals. The aviation subject matter experts can provide guidance and mitigate risk which only they are aware of from experience. Often, FARP personnel may not be familiar with different airframes which they do not habitually support and this produces hazards that only aviation personnel understand and can apply proactive measures and controls to mitigate the associated risk.

Types

During the planning phase, planners need to determine what type of FARP will be suitable for supporting the mission and decide if a FARP is even necessary. There are four standard types that can be used, so let's take a look at each of them.



- An Active FARP provides rapid simultaneous refueling and rearming of combat aircraft.
- A Silent FARP has all the equipment and personnel necessary to assume the role of the active FARP when a decision point or a predetermined time is met.
- A Jump FARP provides the commander with rapid refuel/rearm capability when normal FARP operations are not tactically sound. This type is employed for specific missions with limited scope.
- Lastly, there is the Rolling FARP that allows aircraft to provide convoy security to refuel and rearm at the convoy's location and minimizes the security impact on the convoy by reducing the travel time of returning to an established FARP.

Inspecting

The ASO or the commander's designated representative and the FARP officer in charge (OIC) should work in a collaborative effort to inspect and secure the FARP prior to starting FARP operations. Any pilot might be asked to accomplish this task, so where might one look for guidance? Table C-1, Appendix F, Forward Arming and Refueling Point Site Checklist located in Army Techniques

Publication (ATP) 3-04.17, Techniques for Forward Arming and Refueling Points, is the best place to start if your unit has not established one. This is not all-inclusive and units are encouraged to add additional items as needed to clarify and standardize FARP operations. Some units have a FARP inspection checklist published in their standard operation procedure (SOP) and ready for use. If a discrepancy is annotated, attempt to have it corrected on the spot. Additionally, look for other hazards that might not be on the checklist. The intent of inspecting and walk-through is to mitigate risk to the aircraft and personnel working in and around the FARP during high aircraft density operations. The individuals working in and around the pads need to understand the hazards. Supervisors need to ensure everyone is trained on FARP operations to include the pilots in the event of an emergency. The most important part is to conduct a rehearsal and instill confidence in Soldiers that they know what right looks like in the event of a mishap. I would encourage having an aircraft land at the FARP during the day to observe any hazards that might be an issue for the flight crews landing in the future. Winds and power management have plagued aviators historically during FARP operations.

Safety Concerns

Everyone assumes that the biggest hazard in the FARP is the aircraft that are armed and refueled, but it is not. Many things can wreak havoc on the safe operation at the FARP if individuals overlook what they think is a minor issue. Ammo storage, fuel spills, personnel movement, first aid, foreign object debris (FOD) clearing, grounding points, and fire extinguishers are just a few items that need to be inspected and only become more complicated during night operations.

The Big Deal with FARP Planning

In the last 5 years, there have been 12 mishaps associated with aircraft in or approaching the FARP resulting in \$49,936,112.00 in damages. Whether the mishap was the result of one aircraft taxiing into another aircraft in the FARP or coming in contact with a pole pilots need to remain vigilant of their surroundings. Multiple aircraft have landed under degraded visual environment (DVE) conditions resulting in the over-torqueing of engines due to landing with a tailwind. Knowing what the winds are doing during landing and takeoff is critical and can be the difference in life or death. If you get into a situation while landing there needs to be an

established plan to terminate the maneuver and attempt a second landing, so you are not putting the ground personnel in any danger and eliminating an aircraft flight situation that is not recoverable.

Summary

When you are selected to be the next FARP certifier, ensure you do your homework and do not treat this task as another paperwork drill. Reach out to the Class III/IV platoon sergeant and review their SOP and checklist, before conducting your inspection. This will allow you time to ask questions before walking the FARP. If something does not look right, fix it before the FARP is certified and operational. Own it, and treat it as if it was yours for the safety of the ground crew and the flight crews. ■

References:

ATP3-04.17 Techniques for Forward Arming and Refueling Points

CW4 Robert Moran

Mishap Investigator

Aviation Division

Directorate of Assessments and Prevention

U.S. Army Combat Readiness Center



Simulation: Scenario-Based Training

A viation simulation devices provide a world-class technology for Army aviation rated crewmembers (RCM) to train in simulated combat situations to increase their experience levels, proficiency, and to validate their mission readiness. To gain the maximum value during aviation simulation flight and mission training, unit trainers should use scenario-based simulation training.

Scenario-based training incorporates standards, tactics, techniques and procedures (TTP), and allows RCMs to perform different roles while in mission. These scenarios can be designed around training needs identified by the unit commander.

Standards

All Army training is designed with a standard whether formally addressed in a publication or individually designed by a unit. To conduct effective training while in the simulated mission environment, scenarios should be designed so standards based proficiency can be built and further evaluated.

For aviation crewmembers, these standards are identified in a particular aircraft aircrew training manual (ATM) and detail, conditions and standards of proficiency for each task. An example of an ATM task is "Task 1070 Respond to Emergencies" for the AH-64, with the following standards:

STANDARDS: Appropriate common standards and the following additions/modifications:

1. RCM.

- a. Conduct the emergency response method (fly, alert, diagnose, execute, communicate-fly [FADEC-F]) upon recognition of an emergency.
- b. Identify the emergency condition or system malfunction.
- c. Conduct the emergency procedure.
- d. Select a suitable landing area, if required.

For training or evaluating RCM performance of tasks that are not addressed formally in an ATM,



the unit designs the training and the standards which they believe show proficiency for these tasks. You can find an example of what a unit designed standard would be for a pilot in command (PC) program evaluation in Training Circular (TC) 3-04.11, Commander's Aviation Training and Standardization, provides the guidance to design the program and develop standards based on the commander's guidance.

The TC states in paragraph 6-67, "This program should ensure that the criteria for PC and/or aircraft commander AC selections and designations remain as high as possible, effectively ensuring the tactical and technical proficiency of all PC and/or (AC)-designated personnel. PCs and ACs are required to demonstrate maturity in all circumstances with



sound judgment, to be leaders in the cockpit and/or control station, and to be capable of making sound technical and tactical decisions while executing the unit's Mission Essential Task List (METL) and/or collective task(s)."

Tactics, Techniques and Procedures

Tactics, techniques and procedures (TTP) are an important part of Army aviation survivability measures during combat operations. Leaders can use scenario based missions to identify which TTPs are effective and which are not. As TC 3-04.11 states, "Simulation provides a chance for leaders to assess, validate, and change SOPs and TTP."

To assess, validate, and make changes to TTPs based on simulated missions requires a planned and designed scenario so the conditions can be replicated. The ability to replicate the "same" scenario with the "same" conditions will allow the evaluation of different TTPs to determine which is most effective. Evaluating TTPs during free play simulator scenarios doesn't provide a valid assessment due to the overwhelming number of variables that do not remain common and provide a fair, unbiased comparison.

Roles

Scenario-based simulator training is an excellent opportunity to train and develop RCMs by placing them in roles of increased responsibility (PC, AC, Flight Lead, AMC). Commanders and

unit IPs can design scenarios that provide training for the advanced RCM roles and also for evaluating the RCMs performance in the advanced role to determine proficiency. While ATM tasks typically are designed around hands-on aircraft control, the tasks associated with advanced RCM roles are designed around decision making and managing the crew and mission. Scenario-based simulator training and evaluation for advanced RCM roles provide the commander with validation of proficiency in the most demanding combat environments.

Conclusion

Scenario-based training for aviation RCMs utilizing simulation training is a combat multiplier. The training provides the necessary conditions which are standards based and can be utilized to validate TTPs and can be designed to challenge RCM during training for advanced roles and responsibilities (i.e., PC, AMC).

Taking the time and putting in the effort to plan and implement training scenarios can increase the proficiency and combat capabilities of Army aviation units. It provides the commander with a standardized and replicative process to evaluate their unit RCMs experience levels, proficiency, and to validate their mission readiness. ■

Aviation Division

Directorate of Assessments and Prevention
U.S. Army Combat Readiness Center



Mishap Review - UH-60L Inadvertent IMC (IIMC)

While conducting night vision goggle (NVG) multi-aircraft operations at 500 feet above ground level (AGL), the lead aircraft in a flight of two UH-60Ls, flew into instrument meteorological conditions (IMC). During the execution of inadvertent IMC procedures, the aircraft descended rapidly and struck the ground. The aircraft was destroyed and five of the seven personnel on board were injured.

History

The mishap crew's mission was a multi-ship training mission planned for a daytime departure from an airfield on the installation cross-country to a civilian airport. The mission departure was delayed due to maintenance and then modified to depart in daylight with a transition in-flight to NVGs during the first leg. The crews reported at 1400 hours and the pilot-in-commands (PC) conducted mission planning, risk assessment, and mission briefing while the pilots (PI) completed pre-flight inspections and assisted maintenance personnel with a compass swing (of note, one PI was the air mission commander (AMC)).

The flight of two departed the airfield at 1830, transitioning to NVGs en route to the civilian airport. The flight landed, refueled and the crews had a meal at the civilian airport. At 2318, without updating their flight weather, the flight departed the civilian airport for VFR continuation training during the return to the base portion of the mission. The two aircraft flew in a staggered trail right formation at 120 knots indicated airspeed (KIAS) and at approximately 500 feet above ground level (AGL). The accident aircraft was in the lead and Chalk 2 was to their right rear. The PC was on the flight controls of the accident aircraft. Approximately 15 minutes into the return leg of the flight, the weather began to deteriorate with intermittent rain, low clouds, and fog increasing in low-lying areas. Based on the weather conditions, the crews slowed their airspeed to 90-100 knots, increased the formation separation and communicated their inadvertent IMC (IIMC) procedures. Each aircraft tried utilizing their landing



light to gain better visibility. Lead asked the trail aircraft to leave their light on as it assisted with their crew's ability to see.

Within a few minutes of sorting out the IIMC procedure the flight would use, the rain became heavier and lead announced they were IMC. Chalk 2 relayed they were still in visual meteorological conditions (VMC). Lead called initiating IIMC recovery plan and initiated a climb while maintaining its original heading. Chalk 2 transitioned from VMC into IMC and executed the IIMC plan, initiating a climb and turn to 190 degree heading passing to the left of lead. Chalk 2 then turned left an additional 10 degrees to 180 degrees and initiated contact with air traffic control.

Upon initiating the IIMC plan, the lead (accident) aircraft leveled along the roll axis and initiated a climb straight ahead with the cyclic to allow the airspeed to decelerate to climb airspeed. The PI confirmed these steps and began to tune the radio to request an IFR clearance. The PC then began to make minor turns left and right in the horizontal axis ("fish-tailing"). The airspeed slowed to 50 KIAS, and the PI brought the steep pitch and 50-knot airspeed to the attention of the PC, who remarked, "I got it." The PC lowered the nose briefly and then raised it back again to approximately 20 degrees nose up before the airspeed had a chance to build. The PC eventually entered a left turn and began to level the aircraft in the pitch axis. The accident aircraft then

entered a 20-degree nose-high decelerating attitude. The airspeed slowed to 0 KIAS, and the aircraft began to descend. The PI then issued a second challenge by calling out that the airspeed was 0 KIAS and they were descending. The PC again responded with, "I got it," but did not take corrective action. The aircraft rapidly accelerated to a 2000-foot-per-minute, near-vertical descent. The non-rated flight instructor (FI) called out, "Climb, climb, climb." The PI said, "I have the controls," grabbed the flight controls, and pulled up fully on the collective as the aircraft descended into the trees. At this point, the low rotor audio signal sounded and the PC attempted to lower the collective. The PI overpowered his attempted input and the aircraft continued to settle through the trees and impacted the ground at approximately 2345.

Crew

The PC had 597 hours in MTDS and 969 hours total time. The pilot (PI) had 170 hours in MTDS and 356 hours total time.

Commentary

While conducting night vision goggle (NVG) multi-aircraft operations at 500 AGL, the PC of the lead aircraft in a flight of two UH-60L aircraft encountered IMC and failed to maintain an orientation of the aircraft. That is while executing the IIMC procedure, the PC became spatially disoriented and failed to adjust the aircraft torque to climb power and the airspeed to climb airspeed as outlined in Aircrew Training Manual (ATM), Task 1184. As a result, the aircraft descended rapidly and struck the ground. The aircraft was destroyed and five of the seven personnel on board were injured.

This flight documents numerous failures which became an accident chain. Often, any action taken to correct one of the failures in the chain would have a positive effect on preventing a mishap. At the outset of the mission, the AMC was not involved in the planning, risk management and briefing of the mission. While the mission had been planned in-depth a week prior, this doesn't negate the responsibility of the designated AMC to "AMC" the mission, whether a PI or a PC. In-depth involvement by the AMC in the mission planning and briefing as well as maximum crew participation in the briefing process enhances aircrew situational awareness during the conduct of the mission.

The rated aviators of both aircraft failed to update their weather brief at their intermediate stop. An updated brief would have alerted the crews that en route weather had fallen below their established minimums as defined by their unit SOP affording them the ability to modify their current plan. In respect to weather, crews should be intimately familiar with their unit SOP and established weather minimums and follow the rules in Army Regulation (AR) 95-1 and maintain a current weather briefing. Destination weather may be acceptable but the en route ceiling and visibility may not get you there.

Briefing IIMC should never be overlooked just because the current weather brief shows VFR conditions. The phrases 'IMC will not be a factor' or our IIMC procedure is 'don't go IMC' does not suffice. The weather can change quickly and briefing an IIMC plan during the mission brief is critical to being able to actually successfully execute it. In this case, the crews failed to pre-brief the plan and it resulted in a hasty brief over the radio. This amplifies a bad situation by pushing flight crew attention to radio calls and scrambling for charts (head-in) while in low weather and visibility conditions. The head-in and out during bad weather and visibility with Chalk 2's landing light on is a recipe for spatial disorientation. The ATM notes to be aware of this hazard. Brief IIMC procedures prior to the flight and be prepared.

And finally, do not overstep your capabilities while executing the mission. Army aviators work hard to get the mission accomplished, but when conditions are deteriorating and become hazardous to flight safety in the current mission profile ... modify or abort the mission. Understanding personal limits should be a valid measure each crewmember uses to affect their decision making. Pressing forward on a mission when your gut tells you that you need to abort, turn-around or land, sets you and the crew up for a mishap. Use your good judgment and live to fly another day. ■

Class A - C Mishap Tables

Manned Aircraft Class A – C Mishap Table as of 24 Sep 20										
	Month	FY 19					FY 20			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1 st Qtr	October	1	1	4	0		2	2	3	0
	November	0	0	3	0		1	0	2	2
	December	1	1	2	0		1	1	2	3
2 nd Qtr	January	1	1	0	0		0	0	5	0
	February	2	0	0	0		1	0	5	0
	March	0	1	5	0		0	2	4	0
3 rd Qtr	April	0	1	3	0		0	1	1	0
	May	2	2	6	1		0	0	6	0
	June	0	0	5	0		0	0	6	0
4 th Qtr	July	2	1	2	0		0	2	8	0
	August	1	0	3	1		1	2	6	2
	September	2	1	8	1		0	2	6	0
	Total for Year	12	9	41	3	Year to Date	6	12	54	7
Class A Flight Mishap rate per 100,000 Flight Hours										
5 Yr Avg: 1.08			3 Yr Avg: 1.09		FY 19: 1.15		Current FY: 0.65			

UAS Class A – C Mishap Table as of 24 Sep 20									
	FY 19					FY 20			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	9	2	3	14	W/GE	6	1	3	10
MQ-5	1	0	0	1	Hunter	0	0	0	0
RQ-7	1	13	38	52	Shadow	0	13	20	33
RQ-11	0	0	0	0	Raven	0	0	1	1
RQ-20	0	0	1	1	Puma	0	0	1	1
SUAV	0	0	0	0	SUAV	0	0	0	0
					Other	0	0	1	1
UAS	11	15	42	68	UAS	6	14	26	46
Aerostat	1	1	1	3	Aerostat	3	0	0	3
Total for Year	12	16	43	71	Year to Date	9	14	26	49
UAS Flight Mishap rate per 100,000 Flight Hours									
MQ-1C Class A	5 Yr Avg: 9.56		3 Yr Avg: 9.87		FY 19: 8.77		Current FY: 6.45		
RQ-7B Class A-C	5 Yr Avg: 58.29		3 Yr Avg: 69.64		FY 19: 106.20		Current FY: 111.20		

Forum

Op-ed, Opinions, Ideas, and Information

(Views expressed are to generate professional discussion and are not U.S. Army or USACRC policy)

"I told you it could be done!"

When I came across this old newspaper article, it was a must-read with this title. I always find old stories involving Chinooks interesting; and this article did the trick. It is great to see that Army aviation has always kept risk mitigation as part of every mission. I am not sure that the mitigating factors implemented would be considered effective measures by today's standards. Given it was 1967, I am pleased BG Burdette recognized the need for implementing a few control measures resulting in a successful mission and made this a one-time event. ■

Fort Rucker ski team used Chinook for tow



Scooter Burke, an instructor pilot at Fort Rucker, is pulled across Lake Tholocco by a Chinook.

During one of my three tours at Mother Rucker, my wife and I started the Lake Tholocco Water Ski and Boat Club. We presented many water ski shows at Lake Tholocco for holiday events, as well as traveling to other lakes in the area.

We had a fairly large membership, consisting mostly of military members and their families and some civilian members. We had a para-sail, kite, ballet, a pretty good ski jumping team (which jumped off a ramp built by the post engineers), and many other events.

Always looking for something new and exciting, I had the bright idea to have a skier towed by a Huey. I presented the idea to the then-commanding general, Allen Burdette, (1967) and he said OK, however, Center Safety got into the act and said if it was over water it had to be a Chinook! A bit

surprised, I agreed and with a few practices we worked it out.

The skier was a aviator, Scooter Burke, my IP in Chinook school. He skied behind the Chinook, holding onto a long rope, and holding a very wet and heavy sandbag. The sandbag would keep the rope out of the rotors in the event he fell down. In the Chinook, the flight engineer had an ax and a wooden block on the ramp as an additional safety precaution.

We pulled it off and everything went well. Scooter did leave the water and became airborne for a few seconds during a turn. General Burdette was relieved that things went well and he was not relieved of command. He suggested we quit while we were ahead and make it a one time event.

Bob Wetherbie

Blast From The Past: *Articles from the archives of past Flightfax issues*

Flightfax

Volume 8
Number 2
10 October 1979

Blowing Snow Whiteouts

Winter flying requires specialized techniques. Awareness and training are two essential weapons in the battle against whiteout mishaps.

There are many hazards to operations over snow-covered terrain and one of the problems ranking highest in severity and producing many of aviation's winter mishaps is that of rotor-induced whiteout. Rotor-induced whiteout occurs during operations close to the ground, usually during takeoff or landing. When a flight is performed over loose snow, severe disorientation can occur and you may have the sensation of moving in one direction when, in fact, you are stopped or moving in another direction. This can result in the wrong control input and possibly serious trouble.

Lack of experience or training in a snow environment is the biggest contributor to whiteout mishaps. Consider the following:

Whiteout mishaps

- When a UH-1 pilot, flying in a formation of five, tried to land in blowing snow, he became disoriented, lost control, and crashed. Neither the pilot nor copilot had received any unit training in operations in loose and blowing snow.
- As an OH-58 pilot was taxiing for takeoff, he hovered slowly at a 3-foot altitude over loose and falling snow. Rotor wash created a whiteout condition, and the pilot became disoriented, lost control, and crashed. The pilot had not received any instructions concerning whiteout conditions resulting from hovering too low and too slow over loose and falling snow.
- An OH-58 pilot-in-command (PIC), on a training flight to practice snowfield landings and takeoffs, was terminating an approach when rotor wash-induced blowing snow caused a loss of visual



reference. The aircraft crashed when attempting to land on a ridgeline. The PIC was not qualified as an instructor pilot (IP) for this type of training mission and had not flown in snow operations for 5 months.

- A UH-1 pilot, approaching a landing zone (LZ), flew into heavy blowing snow, lost control, and crashed. The pilot was not familiar with procedures in the operator's manual and continued to land after encountering a whiteout condition. The crew was not adequately trained for snow environment operations.

Know the snow

Knowing the condition of the snow will give you an idea of what to expect during the takeoff or landing phase of your mission. The condition of snow will vary

from loose and dry to well-packed. It may be crusted or melted and frozen to ice. Each condition will produce a different effect when overflying or landing. Use the following factors to determine the condition of snow:

- Where the temperature is -20 degrees Celsius (C) or below, fresh snow will be loose. Any time a wind of 10 knots or more exists, you can anticipate blowing snow. Open areas may be blown clean of fresh snow deposits. However, huge snowdrifts will develop when terrain features such as trees and crevasses block the flow of air.

“The pilot hovered too low and too slow over loose and falling snow, and rotor wash created whiteout conditions.”

- Loose snow that has been exposed to the sun for 3 days or more will form a crust. The depth of this crust will depend on the time it has been exposed to the sun. Overcast conditions will not cause the snow to crust. The rotor wash of an OH-58 may not cause a breaking up of the crusted snow, while the operation of a CH-47 over the same area could cause the crust to break up in pieces.
- Footprints of people or animals provide an indication of the snow condition. Deep prints indicate snow is loose and blowing snow will be encountered when landing. If a person is seen standing atop snow without sinking, you can anticipate crusted or frozen snow.
- A low, slow pass will give an indication of the snow condition. If the rotor wash creates a snow cloud, you must initiate the proper flight technique for a safe landing.

The following techniques are recommended for helicopter operations in a snow environment:

Taxiing In the snow

The helicopter produces the greatest amount of rotor wash when hovering. This creates a very hazardous condition for taxiing skid-mounted aircraft. This hazard is not as serious for aircraft with wheels. These aircraft can ground taxi safely to the takeoff point with only minimum pitch, thus reducing the force of the rotor wash.



Huey pilot, who had received no unit training in snow operations, became disoriented in blowing snow.

If you must relocate a skid-mounted aircraft from the parking area to the takeoff point:

- Ground taxi the helicopter to a point where it can be flown to a hover and air taxied at a high taxi speed (approximately 10 knots to 15 knots). The reason for ground taxiing is to permit positive control of the aircraft when close to other aircraft and obstructions. At this low altitude, the rotor wash will produce an area within the snow cloud where forward visibility can be maintained with the ground. The type of aircraft being flown will determine the size of the clear area. The air taxi speed should be slightly below effective translational lift airspeed. This technique allows the aircraft to be flown forward of the snow cloud where visibility is not restricted by blowing snow.
- Avoid taxiing in the vicinity of another aircraft that is running up or taxiing. Sufficient time should be allowed for the snow cloud produced by another aircraft to dissipate before taxiing through the area.



Blowing snow caused loss of a visual reference as PIC was terminating approach.

Takeoff

The techniques used to take off from snow will vary depending on the type of aircraft you are flying; however, the doctrine for this type of takeoff is common to all helicopters. The following takeoff techniques are recommended:

- Ensure the skids are free from obstruction, e.g., tree roots and rocks, and not frozen to the ground. A visual inspection of the skids will reveal any obstruction that must be removed before takeoff. It may be necessary to get the aircraft light on the landing gear and apply small pedal pressure to insure the skids are not frozen to the ground. CAUTION: Avoid excessive anti-torque control inputs.
- Where the snow is only a few inches thick, application of pitch to the blades before takeoff may blow most of the snow away from the takeoff point, thus reducing the density of snow that will be lifted on takeoff.
- After the above procedures have been accomplished, stabilize the aircraft on the ground

until the snow cloud dissipates. When ready for takeoff, position the cyclic for takeoff. If there are no obstacles along the takeoff route, it should be positioned to achieve a maximum performance takeoff attitude. If the takeoff is to be made over an obstacle, a near-vertical ascent should be made.

- When ready for takeoff, make a continuous application of torque. The aircraft should have no forward movement until clear of the ground. Sufficient torque should be applied to ensure a positive rate of climb. As the aircraft begins to climb, blowing snow will increase and reference to the ground will be temporarily lost. Maintain heading and flight attitude by reference to the flight instruments. When clear of the snow cloud, adjust flight attitude and torque to achieve normal climb airspeed and rate of climb. Throughout the maneuver, the copilot should monitor the engine and transmission instruments.
- Before takeoff, you should discuss with the copilot what action will be taken in the event of an engine failure or rpm bleed-off while in the snow cloud. The normal procedure for single-engine aircraft is to maintain takeoff heading and to perform a hovering autorotation. The copilot's responsibility is to assist in identifying the failure and height above the ground during the descent. If a flight is conducted in a multiengine aircraft, you must determine before takeoff if a single-engine operation is possible based on gross weight. If it is determined the aircraft must be landed, the pilot should beep up the good engine to gain maximum power and position the aircraft in a landing attitude. Power is added during the descent to cushion the aircraft onto the ground.

Landing

When landing a helicopter to snow-covered terrain, you can anticipate being engulfed by a snow cloud unless the proper landing technique is used. This technique requires the aircraft to be flown in front of the snow cloud until it makes contact with the ground. Although the specific technique will vary for each type of helicopter, the doctrine for snow landings is the same for all helicopters. Remember that no two snow landings are the same. You must always anticipate the unexpected and be prepared to cope with any condition that confronts you. Use the following techniques when landing to snow-covered terrain:

- Before initiating the approach, you should learn as much about the touchdown area as possible, e.g., condition of the snow, slope of the area, obstacles.

If the landing is made to an improved landing site, some forward airspeed on touchdown is desirable. However, when landing to an unfamiliar tactical site, forward speed should be dissipated upon touchdown. The approach should be planned so that only minimum power is required to terminate. If there are no obstacles along the approach path, a shallow approach is recommended. If an approach angle greater than a normal approach is required to get into a confined area, it is preferable to terminate the approach out of ground effect above the touchdown point and hover vertically downward. The rate of descent will depend on the condition of the snow. In very loose snow, a slow descent will blow the snow away, allowing you to maintain visual reference with the ground. This procedure permits greater control when in the snow cloud.

- The initial position of an approach to the snow is the same as any other approach. The primary difference is in the last 50 feet. Instead of making the normal deceleration below effective translational lift airspeed, you must maintain this airspeed until just before touchdown. This technique allows you to keep the helicopter in front of the snow cloud until touchdown, after which the aircraft will become engulfed in the snow cloud. The approach angle of the last 50 feet deviates from the standard constant angle of descent. A slight leveling off is required to maintain airspeed. Forward cyclic must be applied to maintain speed. As the aircraft descends to an in-ground-effect attitude, blowing snow will develop to the rear of the aircraft. At this point, begin a deceleration. After the aircraft has begun to decelerate, it should be positioned in a landing attitude. If inadvertent ground contact is made due to poor depth perception, it will not be hard enough to damage the aircraft. Once contact is made, reduce the torque until the aircraft is firmly on the ground. Never plan to terminate the approach to a hover as disorientation can occur easily in a snow cloud.
- The most difficult aspect of the approach is determining your height above the terrain. Trees or other terrain features located in the near vicinity of the landing area provide a good ground reference. If none of these objects are available, it may be necessary to drop an object, e.g., tire, tree limb, or smoke grenade, near the touchdown point. A technique used by UH- pilots is to position the beam of the searchlight between the anti-torque

pedals on the pilot's side. The beam of light forms a good ground reference as you descend to make the landing. This technique is used during daylight only.

- The crew chief should conduct a walk-around inspection to ensure the aircraft is positioned securely on the ground before shutdown. If on a slope, precautions must be taken to ensure the aircraft will not slide downslope after shutdown.
- Night approaches to the snow are normally made to a reference point on the ground, e.g., tactical landing light or runway light. These devices provide a good reference for judging the angle of descent and rate of closure. When executing a night approach to a tactical landing site with lights, always plan your approach to land short of the touchdown point. This technique ensures that you will not overshoot and have to decelerate rapidly in a snow cloud. Additionally, by shooting short, it allows you to maintain airspeed after the level-off thus keeping the aircraft in front of the snow cloud until touchdown. If the landing light or searchlight is used during the approach, position these lights so the beam is beneath the aircraft.

En route

In a non-tactical environment, aircraft will normally be flown at an altitude and airspeed where the rotor wash will not affect loose snow. In a tactical environment, however, you must fly at terrain flight altitudes to avoid destruction by threat weapons. Because terrain flight altitudes are so low to the ground, rotor wash creates a signature identifiable for several miles, particularly when conducting nap-of-the-earth (NOE) flight. En route considerations of which you must be aware when conducting NOE flight over snow-covered terrain are:

- To minimize the effect of rotor wash on loose snow, maintain an airspeed of 40 knots or greater. At this airspeed, the rotor wash is displaced horizontally. Little or no blowing snow will develop, even at NOE altitude.
- When a flight is conducted below 40 knots, avoid flights over forested areas. Snow in the trees is more easily disturbed than snow on the ground. Also, the flight route can be easily detected by the signature left on the trees.
- Avoid flying close formation over the snow. Depending on the nature of the terrain and the condition of the snow, 5 to 10 seconds (about 200 meters) separation should be maintained while en



route. Separation should be extended to 15 to 30 seconds (1/4 to 1/2 mile) just before arriving in the LZ to preclude the possibility of having to land in a snow cloud produced by other aircraft.

- When conducting multi-aircraft operations, avoid flying through narrow valleys or crevasses. Because of the limited maneuver area, aircraft must follow the same ground track thus requiring trailing aircraft to fly through blowing snow. Also, the vibrations produced by helicopters are intensified in a small area and may cause avalanches.
- Terrain features that served as good references for one mission may not be recognizable on the next flight. Snowstorms or winds can change the appearance of a snow-covered area in a matter of hours. An awareness of this phenomenon is essential to ensure accurate navigation.

The specialized techniques listed above, along with much more valuable winter flying information, can be found in DA Training Circular 1-12 (Cold Weather Flying Sense). The time to learn these specialized techniques is now ... before the first snowfall. ■

Editor's Note: Each aircraft aircrew training manual (ATM) now discusses snow considerations based on the specific aircraft. Chapter 3, Rotary-Wing Environmental Flight, of Training Circular (TC) 3-04.4, Fundamentals of Flight, provides the current Army aviation information on cold weather operations and techniques for operating in blowing snow and whiteout conditions.

Mishap Briefs #94

Information based on preliminary reports of aircraft mishaps reported in September.

ROTARY WING

Utility

H-60

L Model

- While performing a training autorotation maneuver at the airfield, the aircraft experienced a hard impact which resulted in damage to the tail wheel and stabilator. (Class C)

- While conducting a preventative maintenance daily at a CONUS airfield, a contract maintenance mechanic discovered damage to the intermediate gearbox cowling, Blue Force Tracker antenna, and all four main rotor blade tip caps. The pilot in command and crew had flown the aircraft earlier that day for 6 hours while conducting training and did not report any issues. (Class C)

- During engine startup, the engine power control levers (EPCL) were advanced to the fly position. Due to a missing screw in the night vision goggle compatibility plate that resides between the EPCLs, the EPCLs were inadvertently allowed to move into lockout and the pilot was unable to retard them. This resulted in an engine overspeed condition on both engines. There were no injuries. (Class C)

M Model

- Aircraft crashed while conducting range operations. Two fatalities. (Class A)

Cargo

H-47

F Model

- During single-engine emergency procedure training, the No. 2 engine control lever was retarded to the ground position. Shortly thereafter, the ENG FAILURE warning light illuminated with an aural warning. The non-rated crewmember (NRCM) announced a fire No. 2 Eng. There was no cockpit indication of an engine fire. The pilot in command pulled the fire handle for the No.1 side. The aircraft landed and the NRCM reported the fire was out. (Class B)



G Model

- During iterative training, the flight engineer closed the aft ramp on the crew chief's (CE) right leg during climb out from their last fast rope insertion/extraction system approach. The CE was issued quarters for 72 hours. (Class C)

FIXED WING

UC-35

A Model

- The aircrew was conducting traffic patterns at an OCONUS airfield for short takeoff and landing training and validation. On the go-around, the pilot made what he believed was a normal go-around power setting resulting in an N1 exceedance on the No. 1 engine. The aircrew noted a significant throttle split (Approximately 3/4 width of the throttle lever knob width split to match N1s) between the No. 1 and No. 2 engine. With the larger than normal split between the throttle lever knobs, it appears that the lever movement during the go-around procedure resulting in higher N1 speed on the No. 1 engine than the No. 2 engine. (Class C)



UNMANNED

MQ-1C

ER Model

- Approximately 20 minutes after takeoff, the aircraft reported a full authority digital engine control (FADEC) DEGRADE caution warning advisory and an additional warning concerning the fuel system. The aircrew declared an emergency and attempted to return the aircraft to the airfield. The engine lost power and the crew attempted a restart. The engine may have been restarted twice, but did not produce enough power to recover the aircraft. The aircrew placed the aircraft into its ditch profile and the aircraft crashed. (Class A)



RQ-7V2

- While in flight, the unmanned aircraft system (UAS) had a degraded primary link before entering the planned training area, causing the crew to change



their mission to land at a different tactical assembly area. While on approach, utilizing the takeoff and landing system, the UAS struck trees short of the landing area and remained lodged in the treetops. (Class C)

- During mission execution, the UAS ascended to 7,000 feet and had been on station for 2 hours. The UAS's audible warning panel showed the system had

experienced both an engine and generator failure. Emergency procedures were implemented and the flight termination system was initiated. The wind dragged the aircraft and parachute approximately 70 meters causing damage. Class B)

- The UAS crew reported lost link during flight, and the aircraft was not recovered. (Class B)

ASMIS 2.0 Mishap and Near-Miss Reporting Application

The U.S. Army Combat Readiness Center released the first ASMIS 2.0 application, the Mishap and Near-Miss Reporting app, Oct. 5. The application will replace ReportIt. However, organizations will have access to ReportIt until Jan. 10, 2021, so reports that were already started can be completed. After Oct. 4, ReportIt will redirect users to the Mishap and Near-Miss Reporting application for all new entries.

The new reporting application is available to accept actual reports. We encourage you to register and use the training module (right button) at <https://mishap.safety.army.mil>. Once on the landing page, scroll to the bottom, where you will find a library of short video tutorials to aid you in navigating the app.



Flightfax

Online newsletter of Army aircraft mishap prevention information published by the U. S. Army Combat Readiness Center, Fort Rucker, AL 36322-5363. DSN 558-2660. Information is for mishap prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. **Flightfax** is approved for public release; distribution is unlimited.



Subscribe to Flightfax

<https://safety.army.mil/ON-DUTY/Aviation/Flightfax.aspx>
If you have comments, input, or contributions to Flightfax, feel free to contact the Aviation Division, U.S. Army Combat Readiness Center at com (334) 255-3530, DSN 558-3530.

Review archived issues of Flightfax:

<https://safety.army.mil/ON-DUTY/Aviation/Flightfax/Archives.aspx>



SUBSCRIBE
TO SAFETY
PRODUCTS



CONTACT
US



Training Circular (TC) 3-04.4, Fundamentals of Flight, states “Aircrews may encounter cold weather flying conditions in many parts of the world. Extreme conditions vary according to latitude and season. Extreme cold and blowing snow pose special problems and difficulties in ground operations, preflight, and actual flight conditions.”

Cold weather operations bring a different set of issues to the plate for Army aviation units who are typically more familiar with operations in hot temperature climates. With the battle focus transition to multi-domain operations, aviation units should become familiar with the tactics, techniques, and procedures (TTP) necessary to operate successfully in cold weather. Let’s look at some of the environmental factors that affect Army aviation operations.

In-Flight Icing:

In-flight icing consists of two types, one is structural and the other is induction. The most hazardous aspect of structural icing (refers to ice forming on aircraft surfaces and components) is its aerodynamic effects which add weight to the aircraft, prevent autorotation capability, and affect airfoil lift capability. Induction icing (air drawn into the engines creates an area of reduced pressure at the inlet, which lowers the temperature below that of the surrounding air) hazards are a buildup of ice on inlets and possible foreign object damage (FOD) from ice dislodging from the inlet into the engine.

Aircraft Operator’s Manuals:

Aircraft operator’s manuals (-10’s) have specific information based on the aircraft and impacts to its operation during cold weather. The planning for how to operate in cold weather environments begins with refresher classes for aircrews concerning particular information for their aircraft. Some of the information may seem common sense, but during cold weather operations, a small mistake before the aircraft is even started can cause damage which results in a mission abort.

Some examples of simple mistakes range from not clearing snow and ice out of an inlet and off rotors/ wings resulting in serious aerodynamic and structural effects in flight, to not having operational anti-ice and blade deice and entering icing conditions which can result in a 20 percent torque increase (H-60) which indicates that normal autorotational rotor rpm may not be possible, should dual-engine failure occur.

The key to success is to understand the impact of cold weather conditions on your aircraft by thoroughly reviewing your -10. Also, do not forget your maintainers, the ability to keep the aircraft flying requires they also conduct refresher training for cold weather operations. Leadership must be involved, as cold weather environment operations require detailed planning and more time to prepare and maintain aircraft (increased timeline from aircraft prep to takeoff.)

Training:

Units qualifying aviators in cold weather/icing operations are responsible for conducting a well-organized training program (ground personnel and aircrews.) Training programs should be geared to instill confidence and develop skills in all areas. Instructor pilots and supervisory maintenance personnel must be highly qualified and skilled to provide the necessary training. Training Circular 3-04.4 provides suggested academic topics and flight training maneuvers.

5 Questions

1. What manual provides aviation crews with information on cold weather environments?
2. Is your aircraft operator’s manual important for cold weather operation success? Yes/ No?
3. Is cold weather training and refresher only necessary for pilots? Yes/No?
4. Leaders don’t have to worry about cold weather operations training, it doesn’t impact them. True/False?
5. Where can you find suggested cold weather academic and flight training maneuvers?

Don't Let *Old Man* **WINTER** Ruin Your Day!

Know the tactics necessary to fight and win in winter weather operations

**Terrain flight tactics
in winter weather**



**Aircrew
survivability
preparedness in
winter weather**



**Mission
planning and
impacts from
winter weather**



**Aviation maintenance
winter weather procedures**



U.S. ARMY



U.S. ARMY COMBAT READINESS CENTER

<https://safety.army.mil>