

**Environmental Factors.** 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. TC 3-04.4 Fundamentals of Flight, Chapter 3.

**Operational Procedures.** Problems occurring when operating in extreme cold are related to preparation for flight, ice and snow, cold weather engine starts, taxiing, takeoff, en route and landing. Problems presented by ice, snow, or freezing rain are such that provisions must be incorporated into flight planning to eliminate or reduce their effects. Remove all snow and ice from the airframe before any operations. Such accumulation adversely affects all aspects of flight performance in varying degrees. Before any flight operations, aviators move all control surfaces to confirm full freedom of movement.

**Training.** Units qualifying aviators in cold weather operations are responsible for conducting a well-organized training program. Training programs are geared to instill confidence and develop skills in all areas of cold weather operations. Instructor pilots and supervisory maintenance personnel must be highly qualified and skilled in all areas of cold weather operations. A recommended program of instruction for qualifying aviators in cold weather operations is provided in TC 3-04.4.

### Five Hazards Associated with Cold Weather Operations

**1. Weather.** Rapidly changing weather is one of the greatest hazards to cold weather operations and presents difficult flying for both inexperienced and experienced aircrews. Various factors—such as temperature range, snow conditions, and icing potential—are subject to rapid and dramatic changes and require crewmembers to be prepared at all times.

**2. Icing.** The most hazardous condition associated with flying in cold weather (excluding aircraft preflight) is aircraft structural icing. Icing accounts for loss of aircraft and personnel each year and must be a critical consideration. Rotor blade icing begins near the blade root. This ice buildup may cause loss of lift, which requires additional engine power.

**3. Snow.** Like so many elements of winter weather, snow is most dangerous to the aircrews that rarely fly in it and do not adequately prepare for its effects. Snow varies widely in its characteristics. It may range from dry, fluffy flakes to a wet, heavy consistency clinging to every surface. Snow visibility estimates and frequency/duration of snowstorms are difficult to forecast. Flight into snow conditions is very disorienting and can easily lead to inadvertent instrument meteorological conditions (IIMC).

**4. Whiteout.** As defined in meteorological terms, whiteout occurs when a person becomes engulfed in a uniformly white glow. The glow is a result of being surrounded by blowing snow, dust, sand or water. There are no shadows, no horizon or clouds, and all depth-of-field and orientation are lost. A whiteout situation is severe in that there are no visual references. Flying is not recommended in any whiteout situation. Flat light conditions can lead to a whiteout environment quite rapidly. Both whiteout and flat light conditions are insidious, occurring quickly as visual references slowly begin to disappear. Whiteout has been and continues to be the cause of several aviation accidents.

**5. Static Electricity.** During cold weather, especially when the air is very dry, static electricity creates serious problems. It is generated by activities such as moving an aircraft through the air, brushing snow and ice from the aircraft, and dragging steel ground cables over the snow. This is particularly hazardous during refueling and rearming operations. It is important to have aircraft properly grounded and bonded to prevent injury and reduce the potential for an explosive reaction. In addition, aircraft external load operations also present a serious potential for static electricity. Preparation should include measures such as ensuring static probes are available for use and verifying personnel are properly trained.