

## **Weather Related Emergencies**

### **High Winds and Strong Turbulence**

Preflight planning for intended airports and winds aloft over the planned route and possible diversions can provide the pilot a means of anticipating the winds that would exceed aircraft or pilot capabilities. However, unanticipated high winds can create an emergency for any aircraft. High winds during cruise flight are not a danger unless they create extreme/severe turbulence, or the pilot is flying with questionable fuel reserves into a headwind that is stronger than expected.

#### ***High Winds and Turbulence During Cruise Flight***

If the winds at cruise altitude provide an unanticipated slower groundspeed than planned, and the fuel reserves are questionable, the flight should be diverted to an alternate airport so there is no chance of running out of fuel for the intended flight. Stronger headwinds and crosswinds slow the groundspeed; tailwinds increase the groundspeed, resulting in the ability to reach airports that are farther away. The GPS is an accurate tool for measuring an aircraft's groundspeed during flight.

In high winds, it is generally advisable to cruise with enough ground clearance to assure that turbulence or sinking air does not reduce altitude to an unsafe level. For example, maintain at least 1,000 feet AGL when flying in strong winds to be far enough away from the ground to account for any turbulence, wind shear, or downdrafts.

If a pilot is flying and sees high wind or a gust front approaching with blowing dust or other indicators, a decision must be made to land and secure the WSC aircraft before the gust front hits, or turn and fly away from the area as fast as possible. Never fly into a gust front. If it looks like strong winds, it probably is and avoiding it is wise.

Strong turbulence can be created from high winds, wind shear, rising/falling unstable air, or any combination of these. As described in the basic flight maneuvers chapter, the pilot should keep the wings and pitch angle within the manufacturer's limitations through power and control bar flying techniques. Generally, if the turbulence continues to increase, fly back to where the turbulence was less severe instead of continuing where the turbulence might become more severe. However, if the pitch becomes too high and a whip stall occurs, as the nose drops into a dive, the pilot should push the control bar full forward and apply full power for the best chance of recovering to normal flight and not progressing into a tumble. The best whip stall/tumble avoidance is to avoid severe turbulence and keeping the nose within the manufacturer's limitations.

### ***High Winds and Turbulence During Takeoffs and Landings***

Takeoffs in high winds can simply be avoided by deciding not to fly. However, if a pilot takes off and encounters high winds or turbulence, high energy should be maintained throughout the climb and departure.

If it is determined that the winds are too high for landing at the intended location, divert to another location or wait until the strong winds subside to land. This is where the Automated Weather Observation Station (AWOS), Automated Surface Observing System (ASOS), or radio contact with other airports can assist the pilot in finding an airport with wind conditions within the pilot's capabilities and aircraft limitations.

If the headwind is within the pilot's capabilities and aircraft limitations but the crosswinds are above any limitations, the pilot may need to land on a taxiway or sideways on a runway that is wide enough, thus reducing the crosswind component to acceptable levels. Strong winds produce strong mechanical turbulence on the lee side of objects which should be considered and avoided during any takeoff or landing in strong winds.

#### ***High Winds During Taxi***

For strong head winds during taxi, the nose must be lowered to keep the WSC aircraft on the ground. Raising the nose could allow the WSC aircraft to lift off. In any case, the nose should be lowered completely to keep the WSC aircraft on the ground. In strong tail winds, the nose must be raised so that the wind does not get underneath the wing and lift it up from the back and possibly tumble it forward. If the wing starts to lift from the back, release the brake and push the control bar forward to keep the wing from lifting and possibly tumbling forward.

Strong crosswinds during taxi must be managed by keeping the wing level or slightly down into the wind so the wind does not catch it, lift up, and topple the WSC aircraft to the side, causing significant damage. If the wind pushes down on the wing, it could pin it to the ground which is the better option. If the wing does become pinned from the wind, the pilot can give some throttle and steer into the wind, rotating around the tip and freeing the wing from the pinned state. This may cause damage to the tip from scraping on the ground. If the windward side gets too high and wind gets under the wing lifting it from the side, all efforts should be made to hold it down while the front wheel is turned downwind and the nose raised to turn with the wind and avoid tumbling sideways.