



Operational Safety in Extreme Weather

Tips on how to guarantee operational safety in extreme weather conditions



Business jets can connect locations within a range of up to 15 hours flight time, this means connecting different regions of the world with unique weather situations.

Departing in areas of extreme cold weather and landing in high temperatures is almost a daily occurrence for many business jets.

Operational limitations for cold weather conditions are roughly a minimum temperature of -40 degrees Celsius for take-off and landing.

On the hot weather side, limitations are around ISA +35 degrees Celsius at most for take-off and landing.

Hot weather operations



Extremely high temperatures present problems to airplane operations different to those of cold weather operations.

Modern business jets are well equipped to operate for certain periods in extreme hot conditions, however, there are concerns about passenger and crew comfort and a decrease in aircraft performance.

On the ground

Cockpit avionics, batteries, and the supply of conditioned air to the cabin are critical to safety.

Without proper supply from the air-cooling pack or conditioned ground air supply, displays and avionics are limited to a maximum use of 30 minutes.

Also, the use of APU bleed air can be limited up to a maximum temperature (for example max. 45 degrees C).

Taxi

Taxiing in areas of high temperature may cause brake temperature limits to be exceeded and as a result, fusible plugs can melt so that tires deflate.

Take-off

Take off performance is affected by high temperatures.

Landing

Landing in high temperatures may not be as demanding as with cold weather, however, the touch down area can be potentially dangerous with rubber and oil deposits from previously landing aircraft. These deposits can melt and become very slick and slippery. Skidding can be a threat if speeds are not reduced to a manageable pace.

Cold weather operations



Extreme low temperature conditions present specific problems to the aircraft equipment, especially when on the ground. Snow, ice, and all forms of precipitation under such conditions can be the worst enemies of an aircraft at all phases (taxi, take-off, inflight, and landing) but there are more considerations to operating in extreme cold than deice or anti-ice.

On the ground

Crew will do a visual check to ensure aerodynamic cleanliness and may need additional equipment to do so (i.e. a ladder).

Like in hot weather operations, APU / avionic batteries also have limitations in cold weather which requires their disconnection or removal for overnight parking as recommended by the manufacturer. Similarly, life rafts, for example, depending on a manufacturer will also have to be removed for cold soaks lower than -28 degrees C.

Heated hangar parking can save a lot of hassle and ensure safer operations

In general, aircraft are ready to operate in extreme temperature conditions and all precautions and procedures are issued by manufacturers and familiarized by operators.

Since business aviation works on tight schedules, accommodates sudden changes in destinations, and promises flexibility for clients, it's vital that all stakeholders to work together to ensure optimal safety.

Crews require support to overcome obstacles while on the ground before they can focus on the flight itself.

The proper auditing and evaluating of ground equipment throughout the entire route are paramount, and good communication between crew, dispatch, and operations teams is essential for safe operations in the business aviation environment.