B777 COLD WEATHER OPERATION (SP.16.2)

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Cold Weather Operations:

Icing conditions exist when OAT (on the ground) or TAT (in-flight) is 10°C or below and any of the following exists:

- Visible moisture (clouds, fog with visibility of one statute mile (1600 m) or less, rain, snow, sleet, ice crystals, and so on) is present, or
- Ice, snow, slush, or standing water is present on the ramps, taxiways, or runways.

Exterior Inspection:

Special emphasis to:

- Surfaces
- Pitot probes and static ports
- Air conditioning inlets and exits
- Engine inlets
- Fuel tank vents
- Landing gear doors
- APU air inlets

Engine Start Procedure:

- Oil pressure may be slow to rise
- Initial oil pressure rise may be higher than normal
- Additional warm-up time may be needed to allow oil temperature to reach the normal range.
- Displays may require additional warm-up time before displayed engine indications accurately show changing values. Displays may appear less bright than normal.

Engine Anti-ice Operation - On the Ground:

Engine anti-ice must be selected ON immediately after both engines are started and remain on during all ground operations when icing conditions exist or are anticipated, except when the temperature is below –40°C OAT.

Before Taxi Procedure:

If taxi route is through ice, snow, slush or standing water in low temperatures or if precipitation is falling with temperatures below freezing, taxi out with the flaps up. Taxiing with the flaps extended subjects the flaps and flap drives to contamination. Leading edge devices are also susceptible to slush accumulations. If there is snow or ice accumulation on the wing, consider delaying the flight control check until after de-icing/anti-icing is accomplished.

Taxi–Out:

When engine anti-ice is required and the OAT is 3°C or below, do an engine run up, as needed, to minimize ice build-up. Use the following procedure:

Check that the area behind the airplane is clear.

777-200 ER (AP-BGJ - AP-BGL, AP-BHX)

- Run-up to a minimum of 50% N1 for approximately 1 second duration.
- Intervals no greater than 15 minutes.

777-200 LR and 777-300 ER (AP-BGY - AP-BHW, AP-BID)

- Run-up to a minimum of 50% N1 for approximately 1 second duration.
- Intervals no greater than 60 minutes.

De-icing / Anti-icing:

Testing of undiluted de-icing/anti-icing fluids has shown that some of the fluid remains on the wing during takeoff rotation and initial climb. The residual fluid causes a temporary decrease in lift and increase in drag. However, the effects are temporary. Use the normal takeoff rotation rate.

Before Takeoff Procedure:

Extend the flaps to the takeoff setting at this time if they have been held because of slush, standing water, or icing conditions, or because of exterior de-icing / anti-icing.

Takeoff Procedure:

When engine anti-ice is required and the OAT is 3°C or below, the takeoff must be preceded by a static engine run-up. Use the following procedure:

Note: Operation in icing conditions may result in engine vibration indications above the normal operating range during ice shedding.

Run-up to as high a thrust setting as practical (min 50% N1), confirm stable engine operation, and if vibration indications are available, ensure engine vibration indications are below 4 units before the start of the takeoff roll.

In-Flight Operation:

- Manual Use of Engine Anti-ice

  When using the engine anti-ice system manually in areas of possible icing, activate engine anti–ice before entering icing conditions.

- Fan Ice Removal

  CAUTION: Avoid prolonged operation in moderate to severe icing conditions.

  During flight in moderate to severe icing conditions for prolonged periods with N1 settings at or below 70%, or when fan icing is suspected due to high engine vibration, the fan blades must be cleared of any ice. Do the following procedure every 15 minutes on both engines, one engine at a time:

  Reduce thrust toward idle then increase to a minimum of 70% N1 for 10 to 30 seconds.

  777-200 LR / 777-300 ER (AP-BGY - AP-BHW, AP-BID)

  > Note: Operation in icing conditions may result in displayed vibration levels up to and exceeding the normal operating range. Extended operation at high vibration levels in icing conditions will not result in engine damage.

- Wing Anti-ice

  Ice accumulation on the flight deck window frames, windshield center post, or windshield wiper arm, or side windows may be used as an indication of structural icing conditions and the need to turn on wing anti–ice.

Cold Temperature Altitude Corrections:

- No corrections are needed for reported temperatures above 0°C or if the airport temperature is at or above the minimum published temperature for the procedure being flown.

- Do not correct altimeter barometric reference settings.

- ATC assigned altitudes or flight levels should not be adjusted for temperature when under radar control.

- Corrections apply to QNH and QFE operations.

- Apply corrections to all published minimum departure, en route and approach altitudes, including missed approach altitudes. Advise ATC of the corrections.

- MDA/DA settings should be set at the corrected minimum altitudes for the approach.

- Subtract the elevation of the altimeter barometric reference setting source (normally the departure or destination airport elevation) from published minimum altitude to be flown to determine “height above altimeter reference source”.

After Landing Procedure:

- Flaps

  After prolonged operation in icing conditions with the flaps extended, or when an accumulation of airframe ice is observed, or when operating on a runway or taxiway contaminated with ice, snow, slush or standing water:

  Do not retract the flaps until the flap areas have been checked to be free of contaminants.

- Engine anti-ice

  Engine anti-ice must be selected ON and remain on during all ground operations when icing conditions exist or are anticipated, except when the temperature is below –40°C OAT.

- Engine Run Up

  When engine anti-ice is required and the OAT is 3°C or below, do an engine run up, as needed, to minimize ice build-up. Use the following procedure:

  Check that the area behind the airplane is clear.

  777-200 ER (AP-BGJ - AP-BGL, AP-BHX)

  - Run-up to a minimum of 50% N1 for approximately 1 second duration.
  - Intervals no greater than 15 minutes.

  777-200 LR and 777-300 ER (AP-BGY - AP-BHW, AP-BID)

  - Run-up to a minimum of 50% N1 for approximately 1 second duration.
  - Intervals no greater than 60 minutes.