

A310 OPERATION IN ICING CONDITIONS

FCOM>>Procedure and Techniques >>Inclement Weather Operation

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Icing Conditions:

- Icing conditions may be expected when OAT (on ground and for takeoff) or TAT (in flight) is below +8 deg C and there is visible moisture in the air (clouds, fog with low visibility, rain, snow, sleet, ice crystals) or standing water, slush, ice or snow is present on the taxiways or runways.
- An ECAM MEMO "TAT in Icing Range" appears when TAT is between +5 and -15 deg C.
- Extended flight in icing conditions with slats extended should be avoided.

Use of Engine Anti Ice:

- Use the criteria of temperature and visible moisture for selecting on the anti ice. Don't wait for ice build up.
- Engine anti ice must be ON during all ground and flight operations when icing conditions exist or are anticipated, except during climb and cruise when SAT is below -40 deg C. However engine anti ice should be ON prior to top of descent and during descent even if SAT is below -40 deg C.
- Ignition should be on CONT Relight before selecting engine anti ice to ON. Ignition may be set to OFF once engine parameters have stabilized.
- If ice accretion is suspected on the engine air inlet, retard throttle on one engine at a time, select CONT Relight and set Engine anti ice to ON. Re-advance throttle to desired level. [Retarding the throttle will reduce N1/N2 speeds and will minimize the risk of internal damage, should the ice build-up break loose and be ingested in the engine. Selecting CONT relight will minimize the potential for engine flame-out due to ice ingestion].
- Avoid unnecessary use of engine anti ice as performance is adversely affected.

Ice Shedding on Ground:

- Periodic engine run-ups should be performed to shed ice from the spinner, fan blades and low pressure compressor stators.
- Minimum of 50% N1 is required for run-ups; however there is no requirement to maintain high N1.
- Run-ups should be performed at regular intervals. Maximum time interval should be 30 minutes.
- First run-up during taxi-out should be done as soon as practical but not more than 30 minutes after engine start. Run-ups are equally important during taxi-in and ground holding.
- All takeoffs when anti ice is required must be preceded by a static run-up to a minimum of 50% N1 while observing all primary engine parameters.

Ice Shedding In-Flight:

- During flight, ice build up on fan spinner and blades is indicated by increasing or high engine vibration level.
- Set Ignition to CONT Relight.
- Set Throttle (affected engine) to 70% N1 (flight profile permitting more than 70% N1 may be set for more complete ice shedding)
- Monitor engine parameters and vibration level (vibration level may peak up to full scale during shedding). Resume normal engine operation when vibration level decreases and stabilizes.
- Above mentioned procedure may be carried out on a preventive basis on one engine at a time. Spool up the engine to 70% N1 or above (flight profile permitting) for 10-30 seconds after every 10-15 minutes.

Wing Anti Ice:

- Wing anti ice may be used to prevent ice formation or to remove it from wing leading edges.
- Wing anti ice should be ON whenever there is an indication (ice accumulation around cockpit windows and wipers) that airframe icing exists.
- Wing anti ice by APU is possible up to 20,000 feet provided only one pack is used.
- Thrust limit corrections and performance penalties are applicable only when wing anti ice is supplied by engine bleed air.
- With evidence of significant ice accretion and to take into account ice on non heated structure, the minimum speed should be VLS +15 when clean and VLS +5 in other configurations. For landing multiply the distance by 1.1
- With wing anti ice inoperative and ice accumulation detected, minimum speed should be VLS +15 when clean and VLS +10 in other configurations. For landing multiply the distance by 1.2

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