NATURAL ICING ON A JET ENGINE AIRPLANE

Definition

When flying in icing conditions, the wing, the empennage, the engines, and many systems of the aircraft may be adversely affected. The aerodynamics characteristics may be affected by:

- decreasing the lift coefficient
- reducing the stall angle of attack
- increasing drag
- decreasing Trimmable Horizontal Stabiliser (THS) efficiency
- decreasing flight control surface efficiency

Purpose of the Flight Tests

To ensure the airplane and its various systems behavior remains safe and operative in icing conditions, with clearly identified penalties in terms of aircraft performance, control and flight domain. It results with Aircraft Flight Manual (AFM) procedures and performances certified to operate safely the aircraft in icing conditions. The performance and control degradations are initially tested during flights conducted with artificial ice shapes mounted on unprotected surfaces (non de-iced parts) of the aircraft, and which are representative of the ice accretion that can be encountered in icing conditions. Some other tests are performed in real icing conditions to verify the relevance of test performed with artificial ice shapes

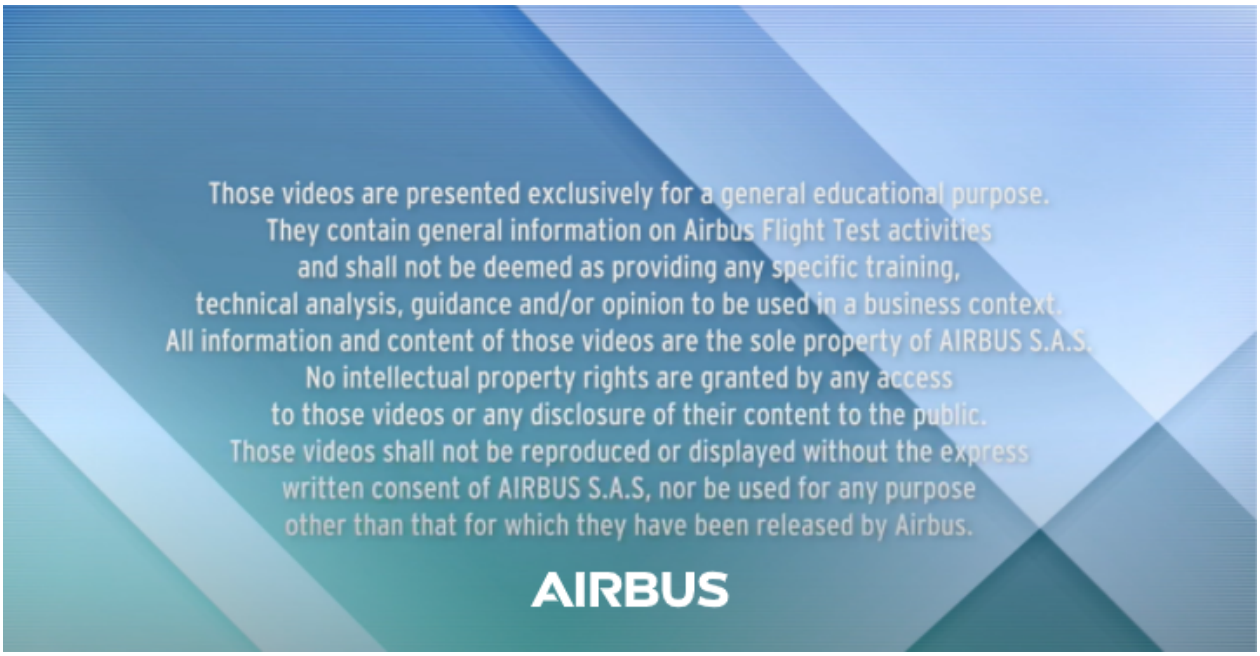
The results of these tests allow the aircraft to be certified for operation in icing conditions (according to CS25) and to provide operating conditions, limitations and procedures for the flight crews to safely operate the aircraft.

Application to Line Operations

Operational limitations, and procedures with regard to flight in icing conditions must be strictly adhered to. However, resilience to even more severe conditions in icing has been successfully tested in flight, providing sufficient safety margins in case of failure of de-icing systems, for which additional operational recommendations will apply.

Flight Test Videos

AIRBUS



Video available on Airbus WIN : https://www.airbus-win.com/