

COMAIR

INTER-OFFICE MEMO

TO: All EMB-120 Pilots

DATE: February 21, 1996

**FROM: Wayne A. Wolke
EMB-120 Program Manager**

FILE NO.: 96020004

SUBJECT: FAA's Icing Report on the EMB-120

The following information is from a press release from Embraer Aircraft Corporation on the final test results conducted with the FAA for controlled flight into freezing drizzle (SLD) and severe icing conditions for the EMB-120 aircraft. The final results are that the EMB-120 aircraft is not susceptible to roll control problems during, or following, inadvertent exposure to the supercooled large droplet (SLD) icing environment and that all other handling characteristics were also acceptable.

In June 1995, the FAA had requested that all manufactures of regional airliners conduct tests to establish the controllability of their aircraft in freezing rain and drizzle. This program was initiated by the FAA because this type of icing environment, and subsequent roll control anomaly, is believed to have been responsible for the ATR-72 accident in Roselawn.

As a result of this request, Embraer established a test plan which first involved wind tunnel tests, flight simulator analysis and an actual test flight in October 1995 of an EMB-120 with theoretical exaggerated ice shapes replicated by wood forms attached to each wing. Upon release of the ice shapes from one wing to simulate the most adverse conditions, the aircraft was responsive to aileron control, and flight was continued until landing, without any need to release ice shapes from the other wing.

In December, Embraer successfully conducted voluntary large water droplet icing tests with an EMB-120 aircraft which performed as expected with little ice accumulation and with no control problems. In addition, pilot visual cues to identify the SLD conditions were also obtained. The testing procedure involved flying a standard airline version of the EMB-120, except for special test recording equipment, behind a U.S. air Force NKC-135A tanker aircraft, which sprayed water at various rates and droplet sizes on the EMB-120. The U.S. Air Force tanker aircraft flew from Edwards AFB in California.

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From this tanker testing, definition of more realistic ice shapes were defined in terms of height and pattern on the wing of the EMB-120. After these ice shapes were duplicated in synthetic form on the aircraft, extensive flight tests were performed by the test pilots from Embraer, CTA (Brazilian aviation certificate authority) and FAA. From these final tests, the results were determined that the EMB-120 is safe to fly in inadvertent icing environments without adverse handling or flight characteristics.

A letter dated February 9, 1996, to the Brazilian aviation certification authorities from the FAA certification office said, "We sincerely appreciate the time and effort expended by both CTA and Embraer in responding to our safety concerns. The responsiveness to this issue has been exemplary, and represents an outstanding example of the aviation industry's willingness to seriously address safety issues".

"Embraer has cooperated with the FAA in gathering and analyzing data with a view to help assure the FAA, our aircraft operators and the flying public that the EMB-120 Brasilia is a safe and reliable aircraft. We are pleased that the FAA has concluded that no control or handling problems exist for the Brasilia in inadvertent icing conditions," said Mauricio Botelho, Embraer's President.

Mr. Botelho added that the regional airlines operating a total of more than 300 Brasilia's worldwide have supported this voluntary testing program.

If you need any further information on (SLD) type icing conditions, or would like to discuss this Embraer release, please call me at any time. Thank You, Wayne!

cc: K. Marshall

COMAIR

MEMORANDUM

TO: Turbo-Prop Flight Crewmembers

DATE: 12/23/96

FROM: Wayne A. Wolke,
Turbo-Prop Program Manager

SUBJECT: Freezing Precipitation "AD"

The FAA Airworthiness Directives on Severe Icing dated May 7, 1996 (AD96-09-24 for the EMB-120 or AD96-09-21 for the SAAB 340) states, "If an airplane encounters Severe conditions that are determined to contain Freezing Rain or Freezing Drizzle, the pilot must take immediate steps to exit the freezing precipitation by changing altitude or course." Severe Icing is determined by the following cues:

- Accumulation of Ice on the upper surface of the the wing aft of the protected boot area. (difficult to detect)
- Accumulation of Ice on the propeller spinner further aft than normally observed, normally associated with propeller vibration and loss of airspeed.
- EMB-120 A/C Only, Unusually extensive ice accreted on the airframe in areas not normally observed to collect ice.

If these conditions are encountered in flight, the crew must take immediate action to escape the Freezing Precipitation in order to comply with the Airworthiness Directive as stated in the respective Flight Standards Manual. Additionally use of the Autopilot may mask tactile cues, and is prohibited when any of the above conditions exist.

This Airworthiness Directive does not prohibit dispatch into forecast Freezing Rain or Freezing Drizzle enroute or at the destination. Dispatch will, however, take this forecast into consideration (March 01, 1997 FAR Part 121 Op's for the EMB-120) in filing altitudes, or alternate airports. The only time that Dispatch is prohibited is when the forecast states "severe icing".

If you have any questions concerning these "AD's", please call me at any time at Ext. 458. Have a safe and enjoyable Holiday Season !