



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

# SAFO

Safety Alert for Operators

SAFO 10006  
DATE: 3/16/10

Flight Standards Service  
Washington, DC

[http://www.faa.gov/other\\_visit/aviation\\_industry/airline\\_operators/airline\\_safety/safo](http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo)

*A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.*

**Subject:** In-Flight Icing Operations and Training Recommendations

**Purpose:** This SAFO provides information concerning approved training programs for flight crewmembers and inadvertent encounters of in-flight icing conditions, including freezing drizzle/freezing rain.

**Background:** This SAFO is applicable to *all* operators. It has been developed in response to National Transportation Safety Board (NTSB) safety recommendations A-96-48, A-96-50, A-96-61 and A-96-67; and supersedes Flight Standards Information Bulletin for Air Transportation (FSAT) 97-03. In addition, it encourages operators to ensure that all pertinent meteorological information is provided to flight crewmembers and dispatchers, both for preflight planning and in-flight decision making when the route of flight may be near areas of potentially hazardous weather conditions.

**a.** On October 31, 1994, an accident involving an ATR-72 occurred while the airplane was en route from Indianapolis to Chicago. Post accident investigation concluded the likely presence of freezing drizzle aloft. Freezing drizzle and freezing rain aloft are considered synonymous with supercooled large droplets (SLD), i.e. those icing conditions containing droplets larger than those required to be demonstrated in aircraft icing certification criteria. SLD may result in ice formation beyond the capabilities of the airplane's ice protection system to provide adequate ice protection. While the flight crewmembers of the ATR-72 were not aware that the icing conditions they encountered could cause dramatic airplane control difficulties, they were aware of the presence of icing.

**b.** As a result of the ATR-72 accident investigation, the NTSB expressed concerns that approved air carrier training programs may not fully address procedures, should flight into SLD conditions be encountered. The NTSB expressed concern about a lack of pertinent weather information dissemination to flight crewmembers and dispatchers as well.

**Discussion:** Safe operations during in-flight icing conditions requires flight crewmembers to be aware of the potential dangers of in-flight icing and under what conditions in-flight icing may be encountered.

**a.** Knowing the type of in-flight icing and where in-flight icing might be encountered is essential to preflight planning and in-flight decision making, should severe icing be encountered. Information is available to both flight crewmembers and dispatchers through airman's meteorological information (AIRMET), significant meteorological information (SIGMET), Center Weather Advisories (CWA), Current Icing Potential (CIP), Forecast Icing Potential (FIP), and the hazardous in-flight weather advisory service (HIWAS).

**b.** After the ATR-72 accident, the Federal Aviation Administration (FAA) issued several aircraft specific airworthiness directives (AD) concerning procedures to identify severe icing conditions, knowledge of the airplanes certification limits, and procedures to safely exit in-flight icing conditions when necessary. In September 1995, the FAA published a document entitled, “Roll Upset in Severe Icing,” which describes icing conditions outside the airplane’s certification icing envelope and provides information about the background, preventative measures, symptoms, and corrective measures on the hazards of roll upset associated with severe in-flight icing. This document can be found at: [http://flightsafety.org/fsd/fsd\\_jan96.pdf](http://flightsafety.org/fsd/fsd_jan96.pdf)

**Recommended Action:** Directors of safety and directors of operations (part 121 and 135); and training managers for all operators are encouraged to review and amend, if required, flight crewmember and dispatcher training programs to include:

**a.** A review of meteorological conditions likely to cause freezing drizzle and freezing rain aloft (SLD conditions)

**b.** Identification of weather information sources and their use relative to in-flight icing. This should include use of AIRMET’s, SIGMET’s, CWA’s, HIWAS and CIP/FIP information, as appropriate, for the flight crewmember’s and dispatcher’s pre-flight planning and in-flight decision making processes.

**c.** Discussion of procedures, including company and Air Traffic Control (ATC) procedures, for pilot weather reports (PIREP) on severe icing to include reporting procedures, content and use of PIREP’s.

**d.** Discussion of information provided to flight crewmembers including identification of severe icing conditions associated with freezing rain and freezing drizzle, immediate exit procedures should severe icing conditions be encountered, and ATC procedures.

**e.** A review of the FAA publication, “Roll Upset in Severe Icing”.

**Contact:** Any questions regarding this SAFO should be directed to the Air Transportation Division, AFS-200 at (202) 267-8166.