

CHARACTERIZATION OF METEOROLOGICAL PHENOMENA INFLUENCING AIRCRAFT OPERATIONS.

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I. Introduction.

Particular meteorological phenomena have an important impact on flight conditions and can present a danger for aviation safety. Then an improvement of security, efficiency and comfort associated to aeronautical transport can be obtained from a better understanding of dangerous weather phenomena and from an improvement of techniques allowing their detection and forecasting.

In U.S.A., the National Transportation Safety Board (NTSB), makes annual aviation statistics for U.S. nonmilitary aircraft accidents. Records for the 1964-1977 period indicate that 43% of all general aviation fatalities were weather related, representing an annual average of 247 fatal accidents and giving rise to 705 fatalities.

Meteorological phenomena that affect flight safety are numerous: low visibility, strong showers, hail, icing, lightning, tornadoes, turbulence, low level wind shears, ... Among these phenomena, the most vigorous are usually associated to thunderstorms. Most of the fatal weather related accidents recorded by NTSB appeared in such conditions. Our goal here is to give a general description of the phenomena associated with thunderstorms and presenting a potential hazard for aviation. Studies on thunderstorms and their impacts on human affairs have been edited by E. Kessler (1981). Special attention to their effects on aviation have been brought by Lee and Beckwith. Large references to this review have been used here.