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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: October 8, 1986

In reply refer to: A-86-97

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On October 8, 1985, the pilot of a Beechcraft 65-B80 (Queen Air), a public use 1/ airplane operated by the National Center for Atmospheric Research (NCAR), lost control of the airplane at approximately 12,300 feet mean sea level (m.s.l.) over Bryce Canyon, Utah. The pilot pulled the aircraft out of a rapid descent after losing about 4,000 feet of altitude. A visual inspection of the airplane indicated that the fuselage had buckled during the pullup maneuver and that the airplane was substantially damaged from overstress. The pilot landed the airplane safely at Bryce Canyon. Although airframe icing was suspected as a factor in the control problem, the evidence was inconclusive as to ice formation.

The pilot was employed as a research pilot and had extensive experience in intentional flight into known icing conditions. The airplane, which was approved for flight into icing conditions, had been used regularly for limited short duration icing research by NCAR. However, the pilot did not know, nor was it discussed in the Airplane Flight Manual, that the airplane was not approved "for extended flight into moderate icing conditions." The pilot stated that while over Bryce Canyon at 12,000 feet, the airplane experienced moderate icing but that he did not consider the amount of ice formation and the rate of formation alarming. He also stated that intermittent activation of the wing deice boots successfully shedded the accumulated wing ice. He further stated that following a request from air traffic control to climb to 14,000 feet, the airplane rolled and nosed over while ascending through 12,300 feet. During the pullup maneuver, the airplane passed within 800 feet of the canyon floor.

The Beechcraft 65-B80 and other light, general aviation airplanes were certificated in the late 1950's and early 1960's under Civil Aviation Regulations (CAR) Part 3, which became effective May 15, 1956. CAR Part 3 did not require a demonstration that the airplane could safely operate in atmospheric icing conditions as a condition of certification. Guidelines for flight in icing conditions were contained in Release No. 434, (the release) of the Federal Aviation Administration's (FAA) Bureau of Flight Standards, dated November 2, 1959. Under the provisions of the release, Part 3 certified airplanes could be approved for flight in light to moderate icing conditions when properly equipped

1/ The National Transportation Safety Board did not investigate this accident and normally does not investigate accidents involving public use aircraft unless requested to do so by the operator.

as specified in the release. However, the release states that the deicing equipment usually provided on "current models of non air-carrier airplanes cannot be expected to cope with heavy or prolonged moderate icing conditions. The latter can be expected to tax the equipment beyond its capacity."

Since 1973, 14 CFR 23.1419 has required that capability for safe flight into icing conditions be certified by in-flight demonstrations in either simulated or actual conditions. For the most part, airplanes that have been type-certificated under 14 CFR 23 have met these requirements. However, many airplanes that were "approved" 2/ under CAR Part 3 for flight into known icing conditions have not met the Part 23 icing certification requirement. Many of these airplanes have deicing or anti-icing equipment--either as original equipment or as after-market installations--as protection for inadvertent icing encounters. Despite this equipment, many of these airplanes do not meet Part 23 icing certification standards. In effect, the FAA recognizes the "grandfathering" of some of these Part 3 airplanes with respect to operation into known icing conditions.

CAR Part 3.772, effective May 3, 1962, and its successor, 14 CFR 23.1559(b), prescribes that an airplane be placarded to clearly indicate that it is approved for, or that it is prohibited from, flight into known icing conditions. The Safety Board believes that all airplanes should have a placard in clear view of the pilot to state that the airplane is approved for, or prohibited from, flight into known icing conditions. Additionally, any limitations to approved flight in icing conditions should be clearly stated. The Beechcraft 65-B80 airplane involved in this accident was certificated on February 20, 1962, and was not placarded, nor required to have been placarded, with a limitation against flight into icing conditions; there was no information on icing limitations in the Airplane Flight Manual; and the pilot was not aware that the airplane was not equipped to cope with extended flight into moderate icing conditions.

The Safety Board has identified 285 general aviation accidents, which occurred between 1975 and 1984, and which resulted in 333 fatalities, where icing was cited as a cause or factor. Over 90 percent of the aircraft involved were certificated under CAR Part 3. The Board believes that this provides sufficient justification for placarding all CAR Part 3 aircraft to comply with CAR Part 3.772.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Require placards, where applicable, in all airplanes certificated under Civil Air Regulations (CAR) Part 3 that have not been certified in accordance with CAR 3.772 to clearly state that the airplane is approved for, or prohibited from, flight into known icing conditions. Any limitations to approved flight into known icing conditions should be clearly stated on the placard. (Class II, Priority Action) (A-86-97)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER and NALL, Members, concurred in this recommendation.

By: Jim Burnett
Chairman

2/ "Approval" was granted by written letter based on compliance with the release, as opposed to certification as being actual flight demonstration.