

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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Forwarded to:

Honorable J. Lynn Helms
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-82-75 and -76

The investigation of an incident involving a Diamond International Corporation's, Hawker Siddeley HS-125-700A, N871D, at MacArthur Airport, Ronkonkoma, New York, on December 21, 1981, has disclosed a problem that is of concern to the National Transportation Safety Board.

The flight had originated at MacArthur Airport to fly passengers to White Plains, New York, Morristown, New Jersey, Wilmington, Ohio, and return via Morristown and White Plains to MacArthur Airport. The runways at all en route airports except Wilmington were clear of snow. The flightcrew reported that the runway condition at Wilmington was good with windrows of snow about 1 inch deep on the runway. According to the crew, shortly before the flight departed Wilmington, 4.5 hours after its arrival, for the return trip to MacArthur Airport, the ramp, taxiways, and runway were plowed. The temperature was in the mid-20's and the snow was powdery.

The postincident inspection of N871D at MacArthur Airport revealed a chordwise crack in the top skin of the left flap about 37 inches outboard of its inboard end. The crack extended from the flap's leading edge to its trailing edge. Examination of the flap in the area of the crack revealed that its spar was broken, and that the inboard end of the left aileron also was damaged structurally. The Safety Board's metallurgical examination of the flap fractures revealed that the failures were typical of overstress breaks.

There were no visible skin buckles or strike damage on the flap's lower surface. The leading edge skin at the outboard end of the flap vane was torn and bent upward about 1/2 inch. The left aileron's inboard closure rib and its trim tab control rod inspection plate were crushed and torn in the outboard direction. One of the two aileron trim tab control rods (inboard) was bowed. The on-scene examination also disclosed that the reason the outboard end of the flap and the inboard end of the aileron were damaged was that the flap shifted outboard after its spar was broken, probably when the flaps were raised from the 75° "lift dump" position 1/ after landing at Wilmington. The flap spar was apparently broken from overloads imposed from contact with snow on the runway at Wilmington, and the damage was not detected while the aircraft was on the ground at Wilmington.

1/ This position is used after landing for increased stopping performance; when selected after landing, the flaps move from 45° to 75° and the airbrakes are opened. These two features decrease lift and increase drag to improve stopping performance.

Section 2, page 19 of the HS-125-700A Crew Flight Manual, contains the following information for landing on very wet, snow, or slush covered runways:

F. Very wet or slush covered runway

Ground clearance with flaps lowered is relatively small, and when operating on a runway with deep puddles, slush, snow or ice:

- (1) Ensure as far as possible that the landing does not result in a go-around after touchdown.
- (2) After every such landing, or aborted take-off, avoid retracting the flaps, if practicable. Examine the top and bottom surfaces of the flaps and adjacent structure for damage, preferably with flaps in the lift dump position. Also ensure that there is no packed slush, snow or ice between flap and wing structure.
- (3) If, after examination, the flaps are confirmed as undamaged, report the fact to the person responsible for the aircraft's maintenance as, at the first convenient opportunity but not later than the next Service A inspection, each flap inboard hinge bolt must be examined for signs of overloading.


On March 23, 1981, an Irving Oil Transport, Ltd., Hawker Siddeley HS-125-700A, Canadian Registration C-GKCI, was involved in a similar incident at Bangor, Maine. On landing at Bangor, the aircraft rolled through snow windrows which were reported by the flightcrew as feeling like heavy bumps. A normal turnaround was completed, and the aircraft departed for St. John, New Brunswick. The postincident inspection at St. John disclosed that the left flap was broken about 12 inches outboard of its inner hinge, probably caused by overloads arising from contact with the snow on the runway at Bangor.

In view of the above, we believe that these types of flap failures, which can be followed by lateral movements outboard that damage the adjacent aileron, create a hazardous condition. Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Operations Bulletin to emphasize the need for compliance with the instructions contained in Section 2, Page 19 of Hawker Siddeley HS-125-700A, Crew Manual, restricting operation of the flaps after landing on a runway with deep puddles, slush, snow, or ice on it until the flaps have been inspected, found undamaged, and are free of ice, snow, or slush. (Class II, Priority Action) (A-82-75)

Issue a General Aviation Airworthiness Alert, Advisory Circular 43-16, to alert operators and owners of Hawker Siddeley, HS-125-700A aircraft of the problems associated with flap breakage when landing on runways with deep puddles, slush, snow, or ice and the possible aileron interference that can occur if a broken flap is retracted. (Class II, Priority Action) (A-82-76)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS and BURSLEY, Members, concurred in these recommendations.


By: Jim Burnett
Chairman