

Aviation safety investigations & reports

de Havilland Canada DHC-2, VH-AQV

Investigation number:

200300674

Status: Completed

The pilot of a de Havilland Beaver floatplane, registered VH-AQV, was conducting a charter positioning flight from Hamilton Island Marina to Whitehaven Beach, Whitsunday Island. At approximately 1615 Eastern Standard Time (EST), the pilot was landing the aircraft towards the south, about 600 m off the beach, to avoid mechanical turbulence associated with terrain at the southern end of Whitehaven Beach. He reported that the approach and flare were normal, however, as the aircraft touched down on the right float, the aircraft swung sharply right and then sharply left. The left wing contacted the water, and the aircraft overturned. The pilot exited the upturned aircraft through the left rear passenger door and activated a 121.5 MHz distress beacon.

The Hamilton Island terminal area forecast (TAF) issued at 0426 EST indicated that the wind was expected to be from 140 degrees at 20 kts. An amended TAF issued at 1043 EST indicated that wind gusts up to 28 kts were expected. The Hamilton Island automatic weather station recorded the wind conditions at 1600 EST as 130 degrees at 26 kts, gusting to 30 kts. The pilot reported that the visibility and general weather conditions were good. There was a slight crosswind from the right and light to moderate turbulence during the approach and landing. He described the sea state as a light swell with significant chop.

The accident flight was the pilot's last of 6 flights into Whitehaven Beach that day. He reported that conditions had remained much the same throughout the day. Another company aircraft had taken off from Whitehaven Beach about 5 minutes before the accident.

The pilot had accrued a total of 486 hours in floatplane aircraft and approximately 1500 water landings, almost all of which were conducted onto still water. He had been with the company for about 1 month at the time of the accident, and had accrued a total of about 50 hours on the Beaver aircraft, almost all on the accident aircraft.

The aircraft was fitted with floats that were larger than standard, in accordance with a supplemental type certificate. The floats extended further forward than standard floats, and the aircraft's centre of gravity was generally close to the forward limit at light weights. The aircraft manufacturer advised that the aircraft "would require a much greater nose-up pitch attitude" on landing than a Beaver aircraft equipped with standard floats.

The pilot cancelled SARWATCH prior to landing as there was no Very High Frequency (VHF) radio coverage once the aircraft was on the water. After the aircraft had overturned, the pilot had no means of communication, other than the distress beacon. The passengers waiting on the beach had no means of communication with either the pilot or the company. When the company did not receive a departure radio report from the pilot,

another company aircraft diverted to the area and located the overturned aircraft. The pilot was rescued from the aircraft by a company helicopter approximately 2 hours after the accident.

At 1637 EST, Australian Search and Rescue (AusSAR) identified an extremely poor quality distress beacon signal located 94 km south of Mackay (194 km south of Whitehaven Beach). The detected signal was of poor quality, most likely because of the position of the satellite relative to the beacon. Another satellite in a better position acquired a signal at 1753 EST, which was determined to originate from a position 31 km northwest of Mackay (74 km south of Whitehaven Beach). AusSAR reported that they did not have a high level of confidence in the location identified, because contact with the beacon signal was only maintained for approximately 100 seconds. AusSAR dispatched a search helicopter from Mackay however the helicopter was not able to detect the signal. AusSAR was not able to conclusively establish that the two distress beacon signals identified in the Mackay area were associated with the activated beacon at Whitehaven Beach.

The wind strength and sea state at the time of the occurrence were not ideal for floatplane operations, particularly given the pilot's relative lack of experience in open water operations. In comparison, it was unlikely the non-standard floats contributed significantly to the development of the accident. The loss of directional control suggests a lower than ideal pitch attitude at touchdown, a configuration which reduces a floatplane's directional stability. The pilot's use of a distress beacon for search and rescue purposes was appropriate, however the timeliness of his rescue from the upturned aircraft can be attributed to the effectiveness of the company's flight monitoring system and subsequent search and rescue actions.

AusSAR further advised the following in relation to distress beacon detection:

"The successful detection of a 121.5 MHz distress beacon by the Cospas-Sarsat system is dependant on a number of factors involving the beacon, the satellite, satellite pass geometry and the receiving station (LUT). These factors include:

"a. the beacon performing in accordance with Australian/NZ standards, particularly the beacon signal meeting approved specifications;

"b. the beacon being deployed correctly i.e. line of sight to the satellite is not obstructed, aerial is fully extended, battery fully charged;

"c. the beacon operating long enough to reach normal operating temperature, allowing the frequency to stabilise, before detection (approx 10 mins);

"d. the satellite and LUT performing in accordance with Cospas-Sarsat specifications;

"e. the satellite having an unencumbered view of the beacon and the LUT;

"f. the LUT receiving a minimum of four minutes of data, which includes the time the satellite was closest to the beacon;

"g. other strong transmissions in the bandwidth may mask the beacon transmission; and

"h. a second satellite pass will be necessary to resolve the ambiguity between the two positions calculated.

"Beacons operating outside the specifications may cause the beacon not to be detected. Moreover, positional accuracy may be affected or side bands may generate multiple detections, masking the real beacon. Nevertheless, even if all the specifications relating to the beacon, satellite and LUT are not met, the system is designed so that 70% or more of the nominal solutions are accurate to within 20 km of the real beacon position, and 95% are accurate to within 40 km of the real beacon position. The operational consequence of these accuracies is that further search activity, typically homing by an aircraft, is required to ascertain the precise position of the distress beacon and the nature of the distress. This may take a number of hours, or might even need to wait until light and weather are suitable for aircraft operations. Pilots need to take account of these timescales when deciding what survival equipment to carry."

AusSAR also advised that the current 121.5 MHz distress beacons will become obsolete in February 2009 when the Cospas-Sarsat satellite system will no longer process the signals. From that time, only 406 MHz distress beacons will be detectable. A 406 MHz beacon is more effective than a 121.5 MHz beacon under most circumstances, because it allows near instantaneous detection by a geostationary satellite, the digital signal includes a unique identification code, the signal is more powerful, and beacon detection is more accurate. Some 406 MHz beacons incorporate GPS position (either integral or external feed) which further enhances AusSAR's ability to accurately locate the beacon. The 406 MHz beacon also requires correct deployment and functioning for optimum performance.

Further information on operation of distress beacons can be found in the Emergency Procedures section of En-Route Supplement Australia (ERSA) or from the AusSAR website.

General details

Date:	06 March 2003	Investigation status:	Completed
Time:	1615 hours EST		
Location (show map):	Whitehaven Beach		
State:	Queensland		
Release date:	24 September 2003	Occurrence category:	Accident
Report status:	Final	Highest injury level:	None

Aircraft details

Aircraft manufacturer	de Havilland Canada
Aircraft model	DHC-2
Aircraft registration	VH-AQV
Serial number	1257
Type of operation	Charter

Damage to aircraft	Destroyed
Departure point	Hamilton Island Marina, QLD
Departure time	1600 hours EST
Destination	Whitehaven Beach, QLD

Crew details

Role	Class of licence	Hours on type	Hours total
Pilot-in-Command	Commercial	50.0	1757

Last update 13 May 2014