

BN2A Mk.III-2 Trislander, G-BEVT

AAIB Bulletin No:	10/98	Ref:	EW/G98/06/19	Category:	1.2
Aircraft Type and Registration:	BN2A Mk.III-2 Trislander, G-BEVT				
No & Type of Engines:	3 Lycoming O-540-E4C5 piston engines				
Year of Manufacture:	1977				
Date & Time (UTC):	8 June 1998 at 1035 hrs				
Location:	Near Jersey Airport, Channel Islands				
Type of Flight:	Public Transport (Passenger)				
Persons on Board:	Crew - 1 - Passengers - 16				
Injuries:	Crew - None - Passengers - None				
Nature of Damage:	None				
Commander's Licence:	Commercial Pilot's Licence with Instrument and Instructor Ratings				
Commander's Age:	55 years				
Commander's Flying Experience:	2,043 hours (of which 50 were on type) Last 90 days - 133 hours Last 28 days - 68 hours				
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB				

History of flight

The commander was operating a scheduled service between Jersey and Guernsey in the Channel Islands. It was his fifth sector that morning, using the same aircraft. The actual weather conditions on the day were given as surface wind 190°/14 kt, 10 km visibility, scattered cloud at 1,200 feet and temperature 17°C.

The aircraft was refuelled with 90 litres of fuel, giving a total on board of 80 gallons (261 kg), 16 passengers were boarded and a loadsheet was presented to the commander which he signed. There was an error in the load entered on the loadsheet so that the aircraft departed the ramp 23 kg above the Maximum Take Off Weight (MTOW) of 4,763 kg. Initial take off from Runway 27 at Jersey was uneventful and the after take off checks were carried out at between 100 and 200 feet

above aerodrome level, (350 and 450 feet amsl). These included retracting the flaps, switching off the electric auxiliary fuel pumps, and reducing engine RPM and manifold pressure to climb power. At this time the pilot observed that the left engine had failed and so he feathered the propeller on that engine and increased to maximum power on the remaining two engines. The pitch of the aircraft was adjusted to maintain a target speed of 80 kt, the recommended speed after the shutdown of an engine. The pilot was unable to climb and he elected to make a landing on a beach which was ahead of the nose of the aircraft.

The aircraft was turned to the left positioning into wind and ATC were informed of the pilot's intentions. The passengers were briefed and on touchdown the remaining two engines were shut down and the propellers feathered. The ground run was estimated by the pilot to have been 300 metres. The passengers were able to evacuate through the normal exits, ATC were advised and the shutdown checks were then completed. This part of the beach is 2 km long and was 400 to 600 metres wide at the time of the incident when the tide was one hour before low water. The sand surface is generally firm where the sea covers it and most of the beach is smooth with an occasional outcrop of rock.

The aircraft was not damaged and, following inspection and ground runs, it was flown off the beach later in the day. On the recovery flight some fuel pressure fluctuations were observed when the electric fuel pumps were switched off. Subsequent engineering investigations involved the replacement of the engine driven fuel pump, the carburettor, the fuel pressure gauge and the fuel pressure transmitter. No definite fault was found and the aircraft was returned to service, following which no further faults were reported.

The aircraft

This aircraft has a Maximum Take Off Weight of 4,763 kg, a figure increased from 4,536 kg two years earlier, authorised by the CAA to accommodate increased standard passenger weights. This weight was authorised for the operator's whole fleet of Trislander aircraft after performance flight tests were carried out on one of their aircraft. At this weight and under the prevailing conditions the aircraft should have been able to achieve a rate of climb of 140 to 160 feet per minute based on the manufacturer's performance graphs. The figure achieved after the incident, under test conditions, on the actual aircraft was 120 feet per minute.

Pilot's experience

The commander had recently joined the company and completed his training less than one month before the incident, having for a time previously been employed as a Flying Instructor based at Jersey Airport. During his training on the Britten-Norman Trislander aircraft simulated engine failures were practised, but not at maximum take off weights.

Radar and ATC information

A ground plot of the radar recording of the flight was constructed. It showed that shortly after passing the end of Runway 27, the aircraft started to track to the left and it never regained a straight course. The maximum height gained was about 200 feet above aerodrome level. The recordings showed that the pilot had clearly stated his intention to land on the beach and had also contacted the tower again after he had landed safely.

Fire services

The Airport Fire Service received the alarm call from the Visual Control Room at 1032 hrs and reached the slipway onto the beach at 1038 hrs. On arrival at the aircraft all the passengers and the pilot were seen to be out of the aircraft and safe. The route down from the airport to the beach is narrow and winding and difficult for a large vehicle to negotiate. It is therefore considered that 6 minutes was an excellent response time.

Discussion

Performance and handling

Since there are no flight simulators for this type of aircraft, all pilot training is conducted on the aircraft. This does not give the pilot under training any opportunity to experience the handling characteristics at heavy weights. If the pilot does not react quickly to an engine failure of this type a yaw will develop which will degrade the climb performance. A factor to be considered is that during training a pilot will be anticipating a failure and will normally react more quickly than would be the case during a line flight where there would be a large element of surprise. The southerly wind gave rise to some turbulence which can also degrade performance. A combination of these factors left the pilot in a situation where he had no confidence in the capability of the aircraft to achieve a climb and so he elected for what he felt to be the safest option, which was a precautionary landing on the beach. It is the custom for Jersey based flying instructors, following simulated engine failure on single engine aircraft, to practice forced landings towards this beach when training student pilots and this may also have influenced the commander's decision.

Procedures and training

The operator's training procedures have been reviewed since this incident and now incorporate a phase of training with the aircraft carrying ballast to enable engine failure practice at realistic operational weights. The operator has also amended the after take off procedure to ensure that the electric fuel pumps are not switched off until a height of 900 feet has been attained.

Loading

The aircraft overloading occurred as the result of an arithmetical error on the part of the handling agent but it was too small to influence the overall performance. The operator has subsequently reviewed its loading procedures to ensure that a suitable verification can be carried out by the aircraft commander. This includes the provision of a hand held computer, with a weight and balance programme, for each aircraft commander.