

SD3-60 Variant 300, G-VBAC

AAIB Bulletin No: 7/2004	Ref: EW/G2004/04/20	Category: 1.1
INCIDENT		
Aircraft Type and Registration:	SD3-60 Variant 300, G-VBAC	
No & Type of Engines:	2 Pratt & Whitney PT6A-67R turboprop engines	
Year of Manufacture:	1988	
Date & Time (UTC):	20 April 2004 at 1925 hrs	
Location:	16 nm South of Bournemouth, Dorset	
Type of Flight:	Public Transport (Cargo)	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Missing hatch only	
Commander's Licence:	Air Transport Pilot's Licence	
Commander's Age:	54 years	
Commander's Flying Experience:	12,763 hours (of which 7,035 were on type)	
	Last 90 days - 69 hours	
	Last 28 days - 26 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot, plus follow up telephone inquiries by AAIB	

At approximately 4,000 feet, whilst descending to land at Bournemouth, the cockpit noise level increased suddenly and the crew saw that the overhead emergency escape hatch on the flight deck had detached and separated from the aircraft. No impact on the airframe was heard or felt by the crew. The flying controls felt normal, and there were no abnormal engine indications. The airspeed was immediately reduced and a PAN call made to Bournemouth, after which a radar positioned ILS approach was carried out to Runway 08 at Bournemouth followed by an uneventful landing. The crew report that the only problem they encountered during the incident was a difficulty in communicating with ATC due to the abnormally high ambient noise level in the cockpit.

The flight deck escape hatch on the SD3-60 is located in the roof, and comprises a simple panel installed into the aperture recess from the outside of the aircraft. It is retained in position by four shoot-bolt type lock pins, operated via a linkage driven from the operating handle on the inside of the hatch. During the final stages of movement when moving the operating handle into the locked position, the linkage moves through an over-centre regime which provides a geometric lock against forces tending to back-drive the mechanism from the lock pin end of the system. Movement of the

lock handle up to the start of the over-centring regime will fully engage the lock pins in their respective recesses in the hatch aperture, but unless the final (small) amount of additional movement required to over-centre the mechanism is completed, then any forces acting on the lock-pins tending to withdraw them could potentially allow the pins to migrate back, and ultimately to disengage, allowing the hatch to separate. A post incident inspection of the aircraft carried out by the operator's maintenance contractor found no evidence of any abnormality or damage affecting the escape hatch aperture or its associated latch pin recesses. The hatch itself was never recovered, and is believed to have fallen into the sea.

The operator reports that on the previous day, some five sectors prior to the incident flight, the aircraft had been used for cabin crew training. The training procedures current at that time called for a practical demonstration of all escape hatches on the aircraft, for the benefit of crew unfamiliar with the type. No distinction was made between emergency exits provided for the use of passengers and exits intended for the use of flight deck crews; consequently, during the demonstration in question, the flight deck hatch operating handle was operated to demonstrate its function. When the instructor attempted to re-engage the lock pins subsequently, she found that she did not have sufficient strength to move the handle through the last part of its movement. Upon leaving the aircraft, she informed a member of ground staff on the ramp that she had been unable to fully lock the escape hatch, and assumed that he would take the necessary action. However, the person whom she informed was not a member of the engineering staff. His attention was subsequently taken up with other activities and he did not follow the matter up.

The company reports that the difference in the position of the escape hatch handle between the *fully locked* and *unsafe* conditions would not have been visually apparent to crews unless for some reason their attention was specifically directed to it. It appears that the lock pins progressively migrated back during the five sectors flown subsequently, ultimately allowing the hatch to move out into the airstream and separate.

The company has since amended its training procedures to exclude the flight deck escape hatch demonstrations from the cabin crew training sessions. It has also introduced a requirement for the cabin crew trainer to make an entry into the Technical log if any exit is removed or if the flight deck oxygen masks are removed, and is planning the introduction of a form to be completed by the trainer and left on the flight deck afterwards to notify crews that the aircraft has been used for cabin crew training.