No: 2/89 **Ref: EW/C1089** **Category: 1a**

Aircraft Type and Registration:	Short Brothers SD 3-30 Variant 100, G-BNTX
No & Type of Engines:	2 Pratt and Whitney PT6A-45R turbo-prop engines
Year of Manufacture:	1982
Date and Time (UTC):	25 October 1988 at 1727 hrs
Location:	Walney Airfield, Barrow-in-Furness
Type of Flight:	Charter
Persons on Board:	Crew - 3 Passengers - 24
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to nose landing gear, doors and operating linkages.
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	60 years
Commander's Total Flying Experience:	9800 hours (of which 397 hours were on type)
Information Source:	AAIB Field Investigation

The aircraft took off from Barrow, (Walney Island) earlier that morning for Southampton with 24 male passengers and a crew of 3 on board. Take-off was on runway 12 with the wind 120°M/08 kt and temperature +14°C. The take-off performance schedule for this runway indicates that the regulated take-off weight for these conditions was 9436 kg. The declared take-off weight was 10,014 kg.

At approximately 1724 hrs the aircraft returned to overhead Walney with the weather recorded at the time of the accident, wind 150°M/12kt, visibility 4500 metres, cloud base reported by inbound aircraft 5000 feet, rain, QNH 1011 mb. The flight was cleared for a left-hand visual circuit for runway 12 which had a PAPI system installed and operating on the right side of the runway.

The approach was apparently uneventful but the aircraft touched down, bounced twice and finally landed nose wheel first. The nose landing gear collapsed and the aircraft came to a halt on the runway. The passengers and crew evacuated the aircraft and were uninjured. The commander made an RTF call but this was not received in the tower.

The controller had seen the aircraft bounce on landing and come to a stop halfway along the runway. He issued taxying instructions over the RTF but received no reply. He then noticed that the passengers were disembarking on the runway and he despatched the aerodrome Rapid Intervention Vehicle to the scene and initiated the full emergency procedures. Upon arrival at the aircraft the fire officer reported that there were no injuries, and no fire. The Cumbria fire and ambulance services attended shortly afterwards.

Examination of the marks on the runway revealed that the nose landing gear had collapsed some 300 metres before the aircraft came to a halt. The nose landing gear is designed such that a hydraulically operated downlock piston engages in a steel lug at the forward end of the landing gear bay when the noseleg has reached the vertical position. It is this pin and lug which resists rearward movement of the leg during landing. However it was clear that on this occasion, the rearward loading on the leg had caused a failure in that part of the casting that housed the actuator and thus allowed the landing gear to fold rearwards. All the fracture surfaces were indicative of overload. The locking pin was slightly bent in a forwards direction showing that it had not come out of engagement with the lug until after the leg had started to move rearwards.

Following the failure the leg had rotated back into the well, allowing the torque link pivot ahead of the wheel to contact the runway. This had become ground away such that the two parts of the linkage had separated. The retraction/extension jack had failed at its attachment to the leg and had been pushed upwards, causing a tensile failure of one of the hydraulic lines to the jack. This had caused a release of hydraulic fluid in addition to that released from the downlock actuator. Additional damage was caused to the doors, door operating linkage and to the tyre, which had burst possibly as a result of contacting the steering mechanism on the rear of the leg. The VHF and DME aerials had been torn from the underside of the forward fuselage, the loss of the former probably being responsible for the loss of RTF communications between the tower and the aircraft.

Payload available for specific charter operations is normally pre-planned by the company's operations department, allowable landing weights being predicted on the longest suitable runway at the destination in still air. The maximum allowable landing weight given in the company's performance schedule in still air for runway 12 at Walney Island was 8965 kg. The estimated landing weight calculated on the loadsheet before departure from Southampton, using standard male passenger weights, was 9744 kg. Upon arrival at Walney Island, with a 10 kt headwind component on runway 12, a further 430 kg would have been available to increase the maximum allowable landing weight to 9395 kg. The landing weight based on the indicated fuel remaining at Walney Island was approximately 9750 kg.