SERIOUS INCIDENT

Aircraft Type and Registration:	BN2B-26 Islander, G-BPCA
No & Type of Engines:	2 Lycoming O-540-E4C5 piston engines
Year of Manufacture:	1986
Date & Time (UTC):	18 December 2010 at 1134 hrs
Location:	Kirkwall Airport, Orkney Islands, Scotland
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 1 Passengers - 3
Injuries:	Crew - None Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	52 years
Commander's Flying Experience:	7,711 hours (of which 4,860 were on type) Last 90 days - 109 hours Last 28 days - 28 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot, the operator's incident report, and subsequent AAIB enquiries

Synopsis

The aircraft landed 20 m to the side of the runway pavement edge when, as the commander was about to flare the aircraft for landing, it was suddenly enveloped in a snow shower.

History of the flight

Kirkwall Aerodrome was closed for snow clearing operations. An agreement between the aircraft operator and the aerodrome authority provided for the aerodrome to be opened for their inter-island operations to land during snow-clearing periods. Although the agreement did not specify which runway should be used, it was common for the operator's Islander aircraft (which are suited to operations on short runways) to use the shorter runway, Runway 14/32, in these conditions, as this minimised the disruption to snow clearing on the main Runway 09/27. There were no instrument approaches to Runway 14/32, which had blue markers, 300 mm high, marking its edges. Runway 09/27 had ILS approaches, was lit, and had a lesser covering of snow than Runway 14/32.

The aircraft departed Papa Westray and flew at 700 ft amsl under visual flight rules towards its destination. En route, the commander assessed the visibility to be 10 km or more with isolated snow

showers either side of the aircraft's track, and a cloud base of around 1,800 ft. As the aircraft approached Kirkwall, ATC reported that the wind was light and easterly and visibility was 1,600 m in snow showers with cumulonimbus clouds. The commander enquired about the condition of Runway 14, and was informed that it was contaminated with between 7 and 10 mm of snow. This was within the operator's limits, and the commander continued a visual approach towards Runway 14. When the aircraft was on base leg, ATC reported that the IRVR[1] was now 900 m. The commander continued his approach towards the runway, which he could see delineated by snow banks on either side.

On final approach, about 350 m from the runway threshold, the commander observed a heavy snow shower on the southern aerodrome boundary, developing northwards towards him. He judged that he would land before it affected the runway, and continued the approach. When the aircraft was over the runway threshold, it was suddenly enveloped in another snow shower, with visibility assessed by the commander as less than 100 m.

Before the commander was able to react and initiate a go-around, the visibility improved again and he was able to see the aerodrome, albeit covered in a fresh fall of snow. The commander held the aircraft in the landing flare while he considered his options. Ahead of him was a "very black cloud, down to ground level". He was also aware of another aircraft holding above the aerodrome at 2,600 ft, the altitude to which he would climb if a go-around was necessary.

He considered that the risks inherent in going around included flying through snow and ice associated with the cumulonimbus cloud (the aircraft was not equipped with weather radar), the aircraft in the hold overhead, and diverting towards his alternate, where he would have to make an approach in similar weather conditions, but with minimum reserve fuel. Although he was aware that he had lost sight of the runway, he considered the only risk associated with landing on the aerodrome would be encountering deep snow; he was aware that the aerodrome surface was flat grass and he was very familiar with landing on rough grass runways.

The commander then saw tyre tracks in front of him, and concluded that these had been made by a vehicle carrying out a runway inspection on Runway 14. There were no hazards on the ground in front of the aircraft, and the commander completed the landing without incident. The aerodrome controller observed the landing, which was north-east of the runway and appeared "very controlled"; he called the aircraft and informed the commander that he had not, in fact, landed on the runway. The aircraft taxied normally to its parking position and was inspected by engineers who found nothing amiss. There was no damage to the aerodrome surface or facilities. An aerodrome inspection found that the aircraft had touched down approximately 20 m from the side of the runway pavement.

The pilot considered that it was possible that the wind had veered and gusted with the snow shower, and this had had the effect of drifting his aircraft from its track towards the runway, and over the grass. He remarked that the blue runway edge markers had been rendered invisible as their sides were covered with snow.

Analysis

The flight proceeded normally until the final moments of the approach when, as indicated by the commander's

Footnote

[1] Instrumented runway visual range. This IRVR was obtained from transmissometers on Runway 09/27 and is not strictly applicable to an aircraft making an approach to Runway 14.

statement, an isolated snow shower, which substancially reduced the visibility, suddenly began over the threshold and affected the aircraft. The commander assessed his options and their relative merits, and saw tracks that gave the impression the aircraft was over the runway.

The incident might have been avoided had the approach not been flown to the smaller of the aerodrome's two runways. The arrangement to land on the shorter runway provided an opportunity to minimise disruption to snow clearing operations, but could present pilots with the task of landing on a runway less clear of snow than the main runway, and which did not have the benefit of its ILS approaches or comprehensive lighting.

Following the incident, the operator suspended this arrangement, and agreed that the aerodrome would not be temporarily opened during snow clearance operations for the operator's aircraft to land. Instead, the parties would seek better co-ordination to enable operations to run to schedule without being affected by snow clearing operations. The operator also clarified its instructions to pilots regarding in-flight visibility requirements, requiring pilots inbound to Kirkwall to conduct instrument approaches if the reported visibility is less than 3,000 m.