Gulfstream G-IV, VP-BIS

AAIB Bulletin No: 3/2000 Ref: EW/G99/12/08 Category: 1.1

Aircraft Type and Registration:	Gulfstream G-IV, VP-BIS
No & Type of Engines:	2 Rolls-Royce Tay 611-8 turbofan engines
Year of Manufacture:	1990
Date & Time (UTC):	13 December 1999 at 1631 hrs
Location:	Norwich Airport
Type of Flight:	Training
Persons on Board:	Crew - 4 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	No damage
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	51 years
Commander's Flying Experience:	8,850 hours (of which 465 were on type)
	Last 90 days - 24 hours
	Last 28 days - 14 hours
Information Source:	AARF submitted by the pilot, ATC reports and subsequent enquiries

Background to the flight

The purpose of the flight was to carry out periodic training and the crew was composed of a Training Captain and three pilots undergoing training. The aircraft was based at Luton Airport and the training was carried out at Norwich Airport. Two full stop landings were planned during the exercise to effect the change over of pilots in the left seat. When the aircraft landed from the first detail the runway condition was wet and an uneventful landing was made using about half the available distance. The crew change was made and the aircraft taxied to the holding point of Runway 27. It was noted that light snow had started to fall but was not settling on the runway. After take off the aircraft entered the radar pattern for an ILS approach to missed approach followed by an NDB/DME approach to land.

Commander's account of the incident

The crew were not in visual contact with the airfield at the missed approach point of the NDB/DME approach and the missed approach procedure was initiated. Although the cloud base had lowered the commander did see some of the approach lights and decided that the next approach would be an ILS to land.

The commander stated that he assumed the runway condition was the same as it had been on the previous landing and subsequent take off, because at no time was he advised by ATC of any deterioration in the weather or change in the runway state/braking action.

He recalled using the following figures from the Flight Management System figures:

LDA Runway 27	6,040 feet
LDR Dry runway	4,795 feet
LDR Wet runway	5,515 feet
Landing Weight	49,650 lbs

He reported that the landing was made at "an acceptable distance" down the runway and at an "acceptable speed" for a wet runway. The thrust reversers were deployed and wheel braking was applied by the handling pilot. When the commander realised that the aircraft was not slowing as expected, he confirmed full reverse thrust and applied his brakes to ensure that there was maximum wheel braking. Deceleration was slow and gentle and the aircraft over-ran the runway near the centreline at, he estimated, about 10 kt. The aircraft came to rest with the main wheels on firm grass about 2 metres beyond the paved area. The nosewheel had sunk into soft ground to about the depth of the tyre.

When he left the aircraft some time later the commander noticed that there was, in his opinion, a significant depth of slush on the runway, and the adjacent grass was covered with snow.

In subsequent discussion with the AAIB, the commander was informed that several Airport personnel had reported that the aircraft had touched down at some point beyond the normal touchdown zone. He confirmed that he was aware that during the final stage of the approach the aircraft was slightly high and fast but the flare appeared normal although the touch down was light. In the darkness, he was not aware of the actual touchdown point or the runway condition, but his experience on the previous landing led him initially to believe the aircraft would stop in the distance remaining.

He felt that the runway was more contaminated than on the previous landing and that the aircraft may have been aquaplaning; there was some evidence of minor aquaplaning on the tyres. He reiterated that he felt none of the 'juddering' which is a feature of normal antiskid braking on this aircraft.

Meteorology

1620 hrs METAR:

Surface wind	360°/3 kt
Visibility	1,200 metres
Weather	Snow
Cloud	Scattered base 400 feet
	Broken base 800 feet
Temp/Dew point	1°C/0°C

1634 hrs METAR Special:

Surface wind	350°/4 kt
Visibility	1,500 metres
Weather	Snow
Cloud	Scattered base 400 feet
	Broken base 800 feet
Temp/Dew point	1°C/0°C

Runway inspections

Snow had been falling at Norwich Airport from about 1530 hrs and an airfield pre-night inspection was started at about 1600 hrs. The controller who made the inspection said that he drove down Runway 27 and observed that the surface was wet but no deposits of snow appeared to have settled. However, a certain amount of snow was observed to be settling on taxiways and Runway 04/22. The AFS was alerted to allow them to start preparations for possible snow clearance. At 1624 hrs, in view of deteriorating weather, the Senior Airport Fire Officer, who acts as snow co-ordinator, decided to carry out his own runway inspection. He was at holding point Alpha 2, waiting to enter the runway to start the inspection, when the Gulfstream landed. When he heard that the aircraft had overrun the runway, he asked ATC permission to enter the runway and immediately went to the scene where he assumed command of the incident.

The runway was inspected after the incident at about 1650 hrs. The controller who carried out the inspection reported that contamination was insignificant on Runway 27, however deposits were accumulating on the north end of Runway 04 and on the taxiways. A Grip Tester run was made subsequently and a report, timed at 1727 hrs, indicated that the braking action on Runway 27 was Medium to Good.

CAA comment

"In view of the fact that a runway inspection was deemed necessary because of the presence of snow, it was incumbent on the Aerodrome Controller to pass, at least, a warning of its existence to the G4's pilot, especially as it was not possible to commence the inspection prior to the aircraft landing."

Conclusion

Although the airfield inspection some 20 minutes after the incident revealed insignificant contamination, it is possible that some snow/slush deposits had formed on the runway after the 1600 hrs inspection and were present when the Gulfstream landed, causing a reduction in braking action at that time. This, combined with the slightly high, fast final approach and light touchdown outside the normal touchdown zone, would have reduced the crews ability to bring the aircraft to a halt in the runway remaining.