Gulfstream G-IV, VP-BHG, 12 November 1998 at 2355 hrs

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Aircraft Type and Registration:	Gulfstream G-IV, VP-BHG
No & Type of Engines:	2 Rolls-Royce Tay Mk 611-8 turbofan engines
Year of Manufacture:	1987
Date & Time (UTC):	12 November 1998 at 2355 hrs
Location:	London Stansted Airport
Type of Flight:	Private
Persons on Board:	Crew - 3 - Passengers - 1
Injuries:	Crew - None - Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	46 years
Commander's Flying Experience:	8,000 hours (of which 3,000 were on type)
	Last 90 days - 60 hours
	Last 28 days - 30 hours
Information Source:	AAIB Field Investigation

The aircraft was on a private flight from Pontoise Airport, France, to London Stansted Airport, the third and final sector of the evening. The aircraft originally departed from Stansted Airport at 1720 hrs, landed at Paris Le Bourget, and then continued to Pontoise. The aircraft left Pontoise at 2307 hrs and landed back at Stansted at 2356 hrs. On the flight deck were the commander, who was the handling pilot, the first officer and a licensed ground engineer.

On the sector inbound to Stansted the crew listened to the Automatic Terminal Information Service (ATIS) 'Y' which included the following information: "RUNWAY IN USE 23, SURFACE WIND 250°/11 KT, VISIBILITY MORE THAN 10 KM, CLOUD SCATTERED AT 2,400 FEET, TEMPERATURE 7°C, QNH 1006. BE ADVISED DUE WORK IN PROGRESS DECLARED REDUCED DISTANCES ONLY ARE AVAILABLE UNTIL TIME 0630 HRS. PILOTS PLEASE NOTE THE GREEN THRESHOLD BAR IS NOT, REPEAT NOT, THE TOUCHDOWN POINT. APPROACH TO TOUCHDOWN MUST BE MADE USING A 3.5° APPROACH ANGLE TO THE TEMPORARY ALPHA PAPIS." The crew members, concerned by the phrase "The green threshold bar is not, repeat not, the touchdown point", discussed the meaning amongst themselves. They decided that the intent was for aircraft to avoid landing at the green lighted end of the runway.

The commander was initially given radar vectors and then, having achieved a good clear view of the airfield, flew a visual approach to Runway 23. He flew an approach profile aiming to touchdown alongside the red "wing bars" located either side of the runway. As he passed the "wing bars" he saw the runway end cones, overflew them and landed, braked normally and came to a stop 100 metres before the threshold of Runway 05.

The VCR controller saw the aircraft moving along the runway at excessive speed and called for the aircraft to "stop" and then called again "hold position". The crew members heard this command but thought it could not apply to them, as they were still airborne. The aircraft touched down and completed the landing entirely in the works area. There were no vehicles or personnel on the paved surface at the time and the crew remained unaware that they were on the closed part of the runway until advised by ATC several minutes later.

Airport Maintenance

Runway 23/05 at Stansted was undergoing a programme of routine maintenance which started on 1 November 1998 and was scheduled to finish on the 22 November. This programme involved closing half of the runway between the hours of 2230 and 0630 and using reduced distances for operations on the remainder. The work was being conducted in two phases, phase one closed the north-eastern half of the runway and was completed on 11 November at 0630 hrs; phase two closed the south-western half and commenced at 2230 hrs on the 11 November. Information about the work in progress was distributed to operators by means of an Airside Safety Notice, NOTAMS, and ATIS broadcasts.

On the night of the incident the programme was on phase two, therefore only the first part of Runway 23 was available, giving a landing distance of 1,500 metres. The lighting consisted of approach lighting, threshold greens, runway side lights, runway end marked by red wing bars, and temporary APAPI units set at 3.5°. The limit of the works area was marked by cones, with red obstruction lights on top, across the runway. The runway side lights on the unavailable part of the runway remained on but were covered to suppress any light. On the two nights after the incident pilots on approach reported that they were unable to see any lights on the closed section of the runway. A simplified diagram of the lighting and runway during the phase 2 work is attached at Figure 1.

The APAPIs consisted of two lights located on the left hand side of the runway abeam the touchdown zone. Red "wing bars" comprised sets of four red lamps on each side of the runway at the stop end. There was a requirement for an initial flight inspection of the APAPIs, which had been conducted satisfactorily.

Aircraft and crew

The commander had operated into Stansted Airport on a number of previous occasions, the most recent being two nights earlier. The required landing distance for the aircraft was 915 metres, under the prevailing conditions, and the distance available was 1,500 metres.

The crew stated that they were able to see the white edge lights along the whole runway length, the first half very bright, and the second half less bright. They were not able to see the illuminated cones across the runway until they passed over them. The actual approach path flown by the aircraft, as measured from radar recordings, was 3° for the final 6 nm.

Discussion

There is always the potential for confusion when work is being undertaken on or close to active runways. Runway closure procedures had been well established in this case by the airport operator and ATC, and both parties thought the information was clear and unambiguous. There was no requirement for an airborne flight check at night, or pilot report, and none was conducted.

The three crew members developed a mental picture of the operating environment at Stansted which was then reinforced by a number of factors. Firstly, they had landed on the first part of Runway 05 two nights earlier, during the phase one work. Secondly, the ATIS instruction not to land on the green lights was interpreted as not to land at that end of the runway. Thirdly, they saw some less bright runway edge lights and thought they were the operational ones. Fourthly, the four red "wing bars" they identified as PAPIs and finally the commander could see the runway ahead was clear.

The commander stated that the most dominant lighting feature on the runway was the red "wing bars". The approach path flown to these suggests that the crew were content to fly a profile below the nominated 3.5° requirement. If they had tried to correct the approach path they would have discovered that there were no white lights associated with the wing bars, as there would be with PAPIs. If the wing bars had consisted of more than 4 lights on each side of the runway a misidentification would have been very unlikely. The runway edge lights on the non-operational segment of the runway were covered but it is possible that a small amount of light was able to escape enabling the pilot to identify the runway outline under the very clear conditions.

After the incident the ATIS message regarding the work in progress was revised to the following "CAUTION, DUE TO WORK IN PROGRESS REDUCED LANDING DISTANCES ARE IN OPERATION. ONLY THE FIRST 1,500 METRES OF RUNWAY 23 IS AVAILABLE. PILOTS MUST FLY THE 3.5° APAPI APPROACH."