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Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608
Australia

1800 020 616

+61 2 6257 4150 from overseas

www.atsb.gov.au

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ATSB TRANSPORT SAFETY REPORT
Aviation Occurrence Investigation AO-2007-064
Final

# Operational event
# Brisbane Airport, Queensland
# 25 November 2007

## Abstract

On 25 November 2007, a Gulfstream Aerospace Corporation G-IV aircraft, registered HB-IKR, was being operated on a charter flight from Brisbane Airport, Queensland to Sydney, New South Wales. At about 2225 Eastern Standard Time the pilot in command of the aircraft commenced a take-off run on taxiway Alpha, adjacent to the active runway 01. The aerodrome controller (ADC) instructed the pilot to cancel the take-off clearance. The crew stopped the takeoff and the ADC instructed them to taxi to the end of the runway for a takeoff using the full runway length. There were no injuries, or damage to the aircraft or airport infrastructure.

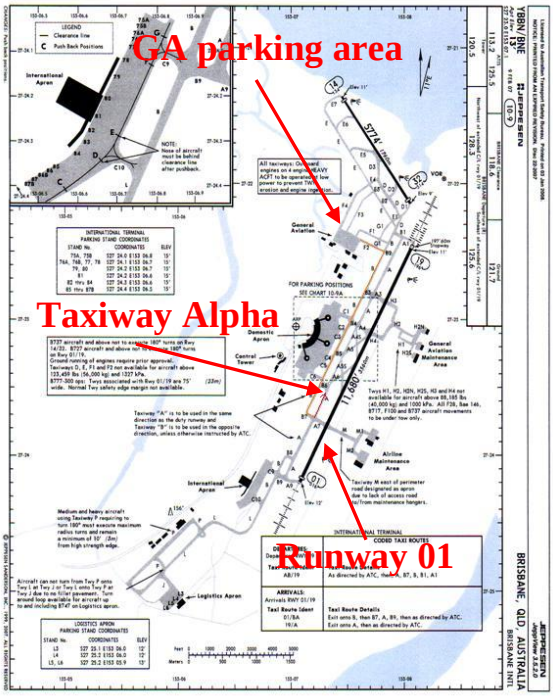
The investigation found that a combination of a cockpit equipment failure, inadequate pilot rest, deficient cockpit resource management practices and unfamiliarity with the airport layout were likely factors that lead to the occurrence.

## FACTUAL INFORMATION

### Sequence of events

On 25 November 2007, a Gulfstream Aerospace Corporation G-IV aircraft (Gulfstream), registered HB-IKR, with two pilots, a cabin attendant and five passengers was being operated on a charter flight from Brisbane, Queensland to Sydney, New South Wales. At about 2225 Eastern Standard Time[1], the pilot in command (PIC) of the aircraft commenced a take-off run on taxiway Alpha, adjacent to the active runway 01 (Figure 1). The aerodrome controller (ADC) instructed the crew to cancel the take-off clearance. The crew stopped the aircraft on the taxiway.

Figure 1: Brisbane Airport chart[2]




The crew and aircraft arrived in Brisbane earlier in the day from Sydney. The aircraft had been parked in the general aviation (GA) parking area at the northern end of Brisbane Airport (Figure 1). Between the time of starting the aircraft's engines and prior to taxi, the PIC's electronic flight bag

1 The 24-hour clock is used in this report to describe the local time of day, Eastern Standard Time, as particular events occurred. Eastern Standard Time was Coordinated Universal Time (UTC) +10 hours.

2 Courtesy Jeppeson Sanderson Inc.

(EFB)[3] display on the left of the cockpit panel became inoperative. The crew had a spare EFB, as well as airport charts that they could have used to assist in taxiway guidance to the runway.

The PIC advised, after the occurrence, that he considered that the spare EFB and charts were not necessary under the circumstances, as the airport layout was 'simple'. He said he had taxied the aircraft into the GA parking area earlier that day. The copilot's EFB was on the right of the cockpit panel; it was operating and the copilot could monitor the taxi route. The PIC noted that, from his position in the left pilot seat he could not see the copilot's EFB.

At about 2215, the crew was issued with an air traffic control (ATC) clearance to taxi via taxiway Foxtrot 2, to the east, then right onto taxiway Bravo for an intersection departure on runway 01 at Alpha 7. An intersection departure had earlier been offered to, and accepted by the PIC. The PIC taxied the aircraft while the copilot conducted the taxi checks and conducted the radio communication with ATC. The copilot was expected by the PIC to monitor the taxi route on the copilot's EFB display. The crew did not discuss or brief the taxi route.

At 2223:30, the crew was notified by ATC that '...the next left Bravo seven leads to the holding point Alpha seven and hold short of the runway contact tower ready one two zero decimal five'. The crew read back the taxi route and the hold short requirement.

The aircraft taxied along taxiway Bravo to the runway intersection at Alpha 7 and at about 2224, as it turned from Bravo into Bravo 7, the crew reported to the ADC '...holding short runway at Alpha seven and ready for departure'. At 2224:16, the ADC issued a take-off clearance to the crew and the crew read back 'cleared for takeoff runway zero one...'. The copilot did not look outside the aircraft during the taxi.

At the time there were no other aircraft taxiing, landing or taking off. An airport safety officer was inspecting runway 01 and had been restricted to an area on the runway, to the south of the Alpha 7 intersection, in anticipation of the takeoff by the Gulfstream in a northerly direction.

The PIC, as the pilot flying, continued the turn and entered taxiway Alpha (Figures 2 and 3) and commenced the take-off run. The airport safety officer saw the Gulfstream accelerating on taxiway Alpha and, at 2225:28, transmitted on the ADC frequency to alert the ADC to the situation.

**Figure 2: Taxiway intersection (in daylight)**


At 2225:34, the ADC instructed the crew to '...cancel the take-off clearance you are on the taxiway, cancel the take-off clearance'. At 2225:46, the crew reported aborting the takeoff.

**Figure 3: Overhead view of intersection[4] with aircraft track highlighted**


The PIC later advised that the aircraft's airspeed was about 80 kts when the take-off clearance was cancelled. The copilot was not aware that the aircraft was not on the runway during the attempted takeoff.

3 Software and data-services solution to digitise logbooks, charts and other flight documents to achieve a paperless cockpit.

4 Courtesy of Google Earth.

The crew was issued a clearance to return the aircraft to the holding point for runway 01 via the taxiway and was instructed by the ADC to taxi for a departure using the full length of the runway. The aircraft was cleared for takeoff at about 2234 and departed for Sydney.

There was no damage to the aircraft or airport infrastructure, or injuries to the passengers or crew.

## Personnel information

### *Flight crew*

The PIC held an Air Transport Pilot (Aeroplane) Licence and a valid class 1 medical certificate. He held numerous aircraft endorsements, including the Gulfstream. He had accrued over 12,000 total flying hours with about 2,500 hours on type. The PIC had previously flown to Brisbane once during the preceding year.

The PIC reported that he 'felt tired' at the time of the occurrence. He had flown from the United Kingdom via Japan during the last week and had experienced broken sleep patterns of 2 to 4 hours during rest periods. Those flights involved travel through a number of different time zones, which was consistent with the potential for the development of 'jetlag'.[5]

The PIC reported having about 9 hours total sleep in the previous 72 hours and had commenced duty that day at 1245. The operator had no fatigue management system but operated within Joint Aviation Authority[6] limits.

The copilot held a Commercial Pilot (Aeroplane) Licence and a valid class 1 medical certificate. He was endorsed on the Gulfstream. He had accrued over 1,150 total flight hours with about 870 hours on type. When he commenced employment with the operator, he had accrued a total of 280 hours.

The PIC had been the copilot's training captain on the Gulfstream and considered him to be inexperienced. The PIC did not allow the copilot to take off or land the aircraft when passengers were on board. The trans-cockpit authority gradient[7] was similar to that of an instructor-student relationship.

The copilot was well rested and had slept in the cockpit for about 3 hours while the aircraft was on the ground at Brisbane. This was the copilot's first flight to and from Brisbane.

### *Air traffic controllers*

Airservices Australia reported that all air traffic controllers involved in the control of the aircraft during its operation at Brisbane Airport that night were licensed, rated and current for the relevant controller positions.

## Meteorological information

The weather conditions at the time of the incident were benign. It was a bright, moonlit night with light winds and good visibility.

## Communications

The transmissions between the air traffic controllers and the crew during the aircraft's start and taxi were recorded by ground-based automatic voice-recording equipment. The quality of those recorded transmissions was good.

## Aerodrome information

There were no notices to airmen affecting the movement of aircraft to or from runway 01.

Airport movement area lighting was operating normally including taxiway, runway and runway movement areas guidance signs (MAGS) at taxiway intersections (Figure 2) and at the runway holding points.

The taxiway lighting consisted of green centreline lights and the runway was lit by white side lights.

5 Mild temporary symptoms produced in human beings by fast travel through large meridian differences; that is, through five or more time zones.

6 The Joint Aviation Authority (JAA) is an associative body of the European Civil Aviation Conference (ECAC), representing the civil aviation regulatory authorities of a number of European states that cooperate in the development and implementation of common safety regulatory standards and procedures.

7 In the aviation domain, the authority relationship between an aircraft captain and the first officer has been cited in many accidents and incidents. Research has shown that there is an optimum 'trans-cockpit authority gradient' to allow an effective interface between pilots on a flight deck (Edwards, 1975). The gradient may be too flat, such as with two equally qualified individuals occupying the two seats, or too steep, as with a dominating chief pilot and a junior and unassertive first officer. In such cases, a reduced performance may result with a chance of error going undetected and uncorrected. *(Transportation Safety Board of Canada - R98V0148)*

## Recorded information

The aircraft was fitted with a Fairchild F1000 Flight Data Recorder (FDR) and a Fairchild A100A Cockpit Voice Recorder (CVR)[8]. Those recorders were capable of recording environmental, aircraft performance and operational information, and any in-cockpit audio and other sounds.

The operator provided the Australian Transport Safety Bureau with access to the FDR and the data was downloaded. Examination of that data showed that the FDR stopped recording prior to the aircraft's arrival in Australia, and had not recorded the occurrence.

The CVR data for the incident flight had been overwritten and was therefore not available to the investigation.

## ANALYSIS

The time of the flight and the pilot in command's (PIC) reported tiredness, possible jetlag and interrupted sleep patterns would have impacted his ability to make effective decisions. In addition, the action to not utilise the less experienced copilot effectively made this a single-pilot operation, marginalising the copilot as a safety defence.

Because of the time of evening, the PIC may have felt under pressure to depart on time and to not inconvenience the passengers. Had the PIC shut down the aircraft and replaced the faulty electronic flight bag with the spare unit, or retrieved the relevant airport charts, he would not have been reliant on his memory from the landing that morning. Combined with a brief of the taxi route with the copilot before leaving the parking area, either of those actions would have greatly reduced the risk of misidentifying the active runway.

The acceptance of an intersection departure at night removed from the crew a number of vital cues, such as the runway threshold markings and lights, that would have indicated that the aircraft was not on the runway when 'lined up for departure'. In addition, the taxiway entrance was very wide, and may have appeared to the PIC to be as large as a runway.

## FINDINGS

From the evidence available, the following findings are made with respect to the operational event involving a Gulfstream Aerospace Corporation G-IV aircraft, registered HB-IKR that was being operated on a charter flight from Brisbane Airport, Queensland to Sydney, New South Wales on 25 November 2007 and should not be read as apportioning blame or liability to any particular organisation or individual.

### Contributing safety factors

- The pilot in command did not use the available means to assist in guiding the aircraft during taxi after his electronic flight bag display became unserviceable.
- The communication between the flight crew was adversely affected by a steep trans-cockpit authority gradient.
- The pilot in command commenced the takeoff on taxiway Alpha at the Alpha 7 intersection.

### Other safety factors

- The pilot in command had limited rest during the day and may have been feeling the effects of jetlag.
- The takeoff was approved from the Alpha 7 intersection, a location that does not have runway threshold markings.
- The pilot in command perceived the copilot as inexperienced, which placed greater cognitive demands upon himself.
- The pilot in command may have imposed time pressure upon himself to complete the task.

### Other key findings

- The airport safety officer saw the aircraft accelerating on taxiway Alpha and alerted the aerodrome controller.
- The flight data recorder was not functioning correctly and thus provided no useful data to the investigation.

8 The CVR retained the last 30 minutes of information on magnetic tape, operating in an endless-loop principle. Whenever electrical power is supplied to the recorder, previously recorded information is progressively overwritten.

# SOURCES AND SUBMISSIONS

## Sources of Information

The main sources of information during the investigation included:

- the flight crew
- Airservices Australia (Airservices).

## Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the Australian Transport Safety Bureau (ATSB) may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to Airservices, the flight crew, the operator, the airport operator and the Civil Aviation Safety Authority (CASA).

Submissions were received from Airservices, the airport operator and CASA. The submissions were reviewed and, where considered appropriate, the text of the report was amended accordingly.