AAIB Bulletin No: 6/93 **Ref: EW/C93/3/1** **Category: 4**

INCIDENT

Aircraft Type and Registration:	Airbus A320, G-IEAF	
No & Type of Engines:	2 V2500 turbofan engines	
Year of Manufacture:	1992	
Date & Time (UTC):	7 March 1993 at 1505 hrs	
Location:	Cardiff Airport	
Type of Flight:	Training	
Persons on Board:	Crew - 5	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	None	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	61 years	
Commander's Flying Experience:	16,568 hours (of which 458 hours were on type) Last 90 days - 69 hours Last 28 days - 58 hours	
Information Source:	AAIB Field Investigation	

The aircraft had been involved in crew training since the initial take off at 1250 hrs and 2 captains had completed their base training; for their conversion the Commander had been operating left-hand circuits on Runway 12. Following a student crew change the aircraft taxied to continue the sortie. As the student was now handling the aircraft from the right-hand seat, the Commander requested right-hand circuits. ATC replied that there was gliding at St Athan and it was agreed that the circuits would be flown at 2,000 feet QNH and that ATC would assist the crew with radar if necessary. At 1458 hrs G-IEAF was cleared for take off for right-hand circuits; just after 1459 hrs the crew reported that they were turning right downwind and were transferred to the approach frequency. On this frequency the Commander maintained visual contact with the runway and initiated his own base leg and finals turns, receiving clearance each time from ATC. The Commander also requested a change to subsequent circuit directions and the approach controller passed this request to the tower controller. At 1503 hrs the Airbus was cleared to change to the tower frequency.

While G-IEAF was on the approach frequency, there were various aerodrome movements including an airways clearance to an ATP aircraft (G-LOGD). Shortly after the ATP was lined up on the runway awaiting take-off clearance, the A320 Commander called on tower frequency and reported 2 nm final with a request for a subsequent left-hand circuit. The aerodrome controller acknowledged and cleared G-IEAF for "low approach not below 400 feet - I've got an ATP on the runway." The Airbus Commander replied "Okay thanks" and did not read back the clearance. The tower controller did not request a readback but instructed him to maintain runway heading until otherwise advised as there was other traffic. The Commander briefed the student that he should do a standard go-around on his command; at this time ATC also warned the ATP that the Airbus was overflying him. Both the Commander and the handling pilot of the Airbus retained visual contact with the ATP throughout the approach.

The ATP Captain considered that the Airbus had overflown at a height well below 400 feet and advised ATC of his intention to submit a report. The Commander of G-IEAF was informed of this but continued his training sortie with a final landing at 1642 hrs; the cockpit voice recorder had recycled but the flight data recorder (FDR) was impounded and returned to the AAIB at Farnborough for analysis.

Close examination of the FDR was made to identify the height at which the go-around was initiated, to investigate the parameters of the go-around, and to determine the height at which the ATP was overflown. Some interpolation was necessary as the FDR sampled the relevant items at intervals of up to 1 second. The information extracted showed that, after take off, G-IEAF made a right turn and flew downwind between 1,900 feet and 2,000 feet QNH. At 1503 hrs the aircraft commenced a right turn to the final heading of 123° and started a descent. At least twelve seconds before the minimum recorded height was reached, G-IEAF passed 400 feet QNH. Four seconds prior to minimum height, at 110 feet above the threshold altitude of 205 feet QNH, a go-around was initiated; this was shown by power lever and side-stick pitch movements. Over the next 4 seconds the Engine Pressure Ratio increased from 1.04 to 1.38. In the same period the pitch attitude increased from +2.5° to +5.6°, and then to 14.5° in a further 4 seconds. The minimum height was derived from the radar altimeter and was recorded as 56 feet ±2 feet. It was not possible to define precisely where on the runway the minimum height occurred. Nevertheless, data from the FDR, and information derived from the ATP Captain's report which stated that the Airbus reached its lowest point some 50 to 75 metres ahead of the ATP, indicate that G-IEAF was between 70 feet and 110 feet radar height when overhead the ATP; the tail of the ATP extends to 25 feet above the ground.

The Manual of Air Traffic Services (current at the time) restricted the minimum go-around height of any aircraft over the runway to 400 feet above the threshold when an aircraft or any vehicle was on the

runway. However the phraseology section did not require the inclusion of a reference datum; the terminology then required was: "cleared low approach (not below ..... feet*) and go-around - **If considered necessary*". The Manual also required the read back of any level change or for the message to be retransmitted. In this situation the Commander acknowledged in his report that he had heard the 400 feet restriction but that it was unexpected. He was expecting an instruction to break off the approach but, having been offered the clearance decided to make use of it to do a normal go-around for practice purposes. His recollection was that he ordered go-around just above his calculated MDA of 405 feet QNH but that the go-around was not immediate and the delayed response caused a further descent.

The CAA has already amended the Manual of Air Traffic Services to require the inclusion of a datum with the 400 feet restriction.