Aviation Safety Investigation Report 199401475

Mooney Aircraft Corp Mooney

06 June 1994

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Occurrence Number:	199401475Occurrence Type: AccidentWagga Wagga					
State: Date:	NSW Monday 06 June	I 1 1994	nv Category	7: 4		
Time: Highest Injury Level:	1503 hours Minor	T	'ime Zone	EST		
Injuries:						
		Fatal	Serious	Minor	None	Total
	Crew	0	0	1	0	1
	Ground	0	0	0	0	0
	Passenger	0	0	0	0	0
	Total	0	0	1	0	1
Aircraft Manufacture	r: Mooney Aircra	aft Corp	,			
Aircraft Model:	M20J					
Aircraft Registration:	VH-LOB			Serial Num	ber: 24-1	284
Type of Operation:	Non-commerci	al Plea	sure/Travel			
Damage to Aircraft:	Substantial					
Departure Point:	Wagga NSW					
Departure Time:	1503 EST					
Destination:	Moorabbin VI	2				

Crew Details:

	Hours on				
Role	Class of Licence	Туре	Hours Total		
Pilot-In-Command	Commercial	20.0	4000		

Approved for Release: Tuesday, November 8, 1994

An RAAF C130 Hercules transport aircraft was conducting touch and go circuits using runway 05. The pilot of VH-LOB called for taxy clearance for runway 05 at 1500.22, (time in hours minutes and seconds.) After establishing the distance remaining for an intersection departure as 1190 metres the pilot requested and received approval for an intersection departure.

At 1502.20 the pilot was cleared to line up on runway 05. A clearance for take off was given at 1502.59 and the pilot quickly applied take off power and commenced the ground roll. The lightly loaded aircraft was soon airborne. The landing gear and then the flaps were retracted. Suddenly the aircraft rolled very rapidly to the left and pitched nose down. Despite application of full opposite aileron and rudder and nose up elevator the pilot was unable to prevent the aircraft from descending left wing down into the ground to the left of the runway.

The investigation concluded that the accident was due to an encounter with wake turbulence from the C130. Under the Manual of Air Traffic Services (MATS) instructions the minimum separation between a light aircraft making an intersection take off behind a medium aircraft, was three minutes. This standard was required to be applied by the air traffic controller at Wagga.

Information provided by the RAAF indicated the C130 was making consistent circuits, with the base call given just after the base leg turn was commenced. They indicated the time from making the call until the aircraft touched down, was 80-90 seconds. After a short ground roll power was re-applied for take off and lift off was achieved an estimated 150-180 metres beyond the taxiway intersection from which the take off in VH-LOB was commenced.

The time between base calls on the last four approaches for the C130 averaged four mimutes and 28 seconds, with all being within eight seconds of this average. The last base call by the C130 crew was at 1459.42, some three minutes and 17 seconds before VH-LOB was cleared for take off. Considering the C130 crew's estimate of 80 to 90 seconds to touchdown from this call, the indications were that the three minute separation standard was not met.

The controller said that the C130 base leg calls were given when the aircraft was half way around base leg. He also estimated the time from these calls to touchdown was 30 seconds and to lift off was one minute. On the touch-and-go landing immediately before the accident, the controller believed that the C130 touched down 12 to 15 seconds past the hour, at about the time VH-LOB taxied. Under MATS provisions the controller is allowed to anticipate that the standard will exist at the time of lift off. In the controllers opinion he had the required three minutes separation. He did not, and was not required to, record any times so these estimates could not be verified.

The Civil Aviation Authority (CAA) published an Aeronautical Information Circular (AIC) H 11/1991, on wake turbulence hazards and characteristics. This AIC was still current at the time of the accident. It stated that wake turbulence vortices (there is one from each wing) start at rotation for lift off and end at touch down. These vortices tend to sink until close to the ground and then move sideways at about five knots.

The vortice from the right wing moves to the right, while that from the left wing moves to the left. The light wind conditions existing at the time of the accident, probably resulted in the right wing vortice remaining above the runway. The AIC stated that in stable conditions wake vortices can exist for in excess of three minutes.

From the available evidence it has not been possible to conclusively establish whether the required separation of three minutes existed at the time VH-LOB took off.

Significant Factors

The following factors were considered relevant to the development of the accident:

1. The light wind conditions that existed at the time probably resulted in the right wing vortice remaining over the runway.

2. Wing tip vortices generated by normal operations in the C130, persisted long enough and were of sufficient intensity to cause a control loss in VH-LOB.