Aviation Safety Investigation Report 199102553

Agusta A109A

11 September 1991

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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 <u>www.atsb.gov.au</u>.

Occurrence Number: Location: Date:		199102553 Hardy Reef Qld 11 September 1991			Occurrence Type: Accident	
Highest Injury Level: Injuries:		Minor			<b>1 mc.</b> 152	
U			Fatal	Serious	Minor	None
		Crew	0	0	0	0
		Ground	0	0	0	-
		Passenger	0	0	6	0
		Total	0	0	8	0
Aircraft Details:	Agusta	A109A				
<b>Registration:</b>	VH-LHJ					
Serial Number:	7137					
<b>Operation Type:</b>	Charter					
Damage Level:	Substantial					
<b>Departure Point:</b>	Hamilton Island Qld					
<b>Departure Time:</b>	1445 hours					
Destination:	Hardy F	Reef Old				

## Approved for Release: 21st July 1992

## **Circumstances:**

The helicopter was operating onto a floating pontoon situated adjacent to a reef area. The pontoon was 30.65 m long and 9.32 m wide and consisted of a wooden platform mounted above two steel floats. A series of hardwood joists 295 mm x 85 mm and approx. 950 mm apart were mounted between the floats and 35 mm x 110 mm hardwood decking was nailed to the joists to form the platform surface. The decking ran lengthwise along the pontoon. The pontoon was constructed in 1985 and had been in operation almost continuously since then. While mainly skidequipped helicopters operated onto the pontoon, it had also been used by wheeled helicopters, including the Agusta 109. It was established that Agusta 109s had landed on the pontoon on some hundreds of occasions prior to the accident. Company pilots reported that they had observed decking planks bend when subjected to the weight of the Agusta 109 through its mainwheels. For this reason, the general practice for Agusta 109 operations onto the platform was for the mainwheels to be positioned over the joists when landing along the pontoon parallel to the decking. At the time of the accident, there was a northerly wind at about 15 kts and the pontoon was pitching some 25-30 cm in the swell. The northern end of the pontoon was occupied by another company helicopter which had just landed and was parked across the pontoon with its engine running and passengers still on board. VH-LHJ approached into wind to land along the pontoon. The helicopter was being flown by the pilot in the left seat. Shortly before the wheels contacted the decking, the pilot in the right seat opened his door to check the position of the mainwheels in relation to the joists. As the mainwheels touched the surface, he reported to the pilot flying the aircraft that the mainwheels were 6-8 in behind the beam. As the weight of the helicopter was transferred to the wheels, the right-seat pilot saw the decking beneath the right mainwheel flex slightly and then crack and break. The helicopter rolled rapidly to the right and the main rotor blades began impacting the pontoon and the water. The helicopter eventually came to rest on its right side, having veered about 130<sup> to the right adjacent to the southern</sup> edge of the pontoon. The impact forces destroyed the main rotor blades, substantially damaged the rotor head, and

broke the tail boom. There was no evidence of any fault in the helicopter which might have contributed to the accident. There was also no evidence of a hard landing or any other pilot-related aspect which might have caused excessive loads to be placed on the decking during the landing sequence. The investigation therefore focused on the pontoon itself and a study was commissioned to examine the strength of the pontoon decking with respect to the helicopter types known to use the pontoon. The results of the evaluation of the pontoon decking were as follows 1. The condition of the decking timber was such that deterioration due to exposure to the elements was concluded not to have been a factor in the deck failure. 2. The failure of the decking when subjected to Agusta mainwheel loading was due to grossly excessive bending stress. The overload factor was calculated as 8.39 and readily explained the failure. The only pontoon design documentation which could be located concerned the general structure and dimensions of the pontoon and contained no details on deck strength considerations. No comment can be made, therefore, as to whether the wheel or skid loadings of the various helicopter types using the pontoon, and particularly those for the Agusta 109, were considered during the design of the pontoon.

## **Significant Factors:**

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

- 1. The strength of the pontoon decking was inadequate for Agusta 109 operations.
- 2. The pontoon decking failed due to excessive bending stress when subjected to loading through the right mainwheel of the helicopter.

## **Reccomendations:**

The helicopter operator and the pontoon owner, along with the Civil Aviation Authority (CAA), were notified of the progress of the investigation. This included information contained in a preliminary report followed later by the complete testing details, technical analysis, and stress calculations concerning the pontoon decking. The analysis concluded that the strength of the decking was inadequate for all helicopter types which used the pontoon and steps were instituted by the operator and the pontoon owner for the deck to be strengthened.

1. A recommendation was made to the CAA on 13 September 1991 that the circumstances of the accident be brought to the attention of other organisations involved in operations on to helicopter landing sites with timber decking and that these organisations confirm the design specifications of those surfaces for the particular types of helicopter involved.

2. It is further recommended that the Civil Aviation Authority through surveillance, following the failure and subsequent repair of this pontoon, confirm that the pontoons and other helicopter landing sites which are being used by this operator, have the structural integrity to accommodate operations of the relevant helicopter types.