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## Accident

Status:	Final	languages:   
Date:	30 JUN 1994	
Time:	17:41	
Type:	<a href="#">Airbus A.330-321</a>	
Operator:	<a href="#">Airbus Industrie</a>	
Registration:	F-WWKH	
C/n / msn:	042	
First flight:	1993	
Total airframe hrs:	360	
Engines:	2 Pratt & Whitney PW4164	
Crew:	Fatalities: 3 / Occupants: 3	
Passengers:	Fatalities: 4 / Occupants: 4	
Total:	Fatalities: 7 / Occupants: 7	
Airplane damage:	Written off	
Location:	Toulouse-Blagnac Airport (TLS) ( <a href="#">France</a> )	
	 <a href="#">show on map</a>	
Phase:	Takeoff	
Nature:	Test	
Departure airport:	<a href="#">Toulouse-Blagnac Airport (TLS/LFBO)</a> , France	
Destination airport:	<a href="#">Toulouse-Blagnac Airport (TLS/LFBO)</a> , France	
Flightnumber:	129	

### Narrative:

The test flight was part of the preparation required for the certification of the Pratt & Whitney equipped Airbus A.330 autopilot to Cat. III standards (approach and go-around under very bad visibility conditions). The first part of the test flight was completed successfully when the aircraft landed on runway 15L. A 180deg turn was made for a runway 33R takeoff. The second takeoff was to be performed under conditions similar to those of the first takeoff. For this test however, the autopilot would incorporate the modification under study (Spatial with Bubble in 3972 state). The aircraft weighed 147,700kg and a centre of gravity of 42%. The takeoff was performed by the co-pilot with TOGA (takeoff Go Around) power, instead of Flex 49 (a lower power setting). Rotation was positive and pitch input was stopped when the attitude changed from 12deg to 18deg nose-up. Within 5 seconds after takeoff several attempts were to engage the autopilot were unsuccessful. After it was engaged, activation was delayed by 2 sec because the 1st officer was exerting a slight nose down input on the side stick. The aircraft, still trimmed at 2.2deg nose-up pitched up to reach 29deg and the speed had decreased to 145 knots. The captain meanwhile reduced thrust on the no. 1 engine to idle and cut off the hydraulic system in accordance with the flight test order. Immediately after it activated, the autopilot switched to altitude acquisition mode (altitude had been set at 2000 feet on the previous flight phase). This caused the pitch attitude to increase to 32deg in an attempt to reach 2000 feet. The speed decreased

further to 100 knots (minimum control speed=118ts!). Roll control was lost and the captain reduced no. 2 engine thrust to idle to recover symmetry on the roll axis. Bank and pitch attitudes had reached 112deg left and -43deg resp. before the pilot managed to regain control. It was however too late to avoid ground impact at a pitch attitude of around -15deg.

**PROBABLE CAUSES:** "At the present stage of its work, the commission estimates that the accident can be explained by a combination of several factors none of which, taken separately, would have led to an accident.

The initial causes are primarily related to the type of the test and its execution by the crew during the last takeoff:

1) choice of maximum power (TOGA) instead of Flex 49; 2) very aft CG for the last takeoff; 3) trim set in the takeoff range, but in too high a nose-up position; 4) selected altitude of 2000 feet; 5) imprecise and late definition of the test to be conducted and the tasks to be performed by the captain and first officer, respectively; 6) positive and very rapid rotation executed by the first officer; 7) the captain was busy with the test operations to be performed immediately after take off (engagement of the autopilot, reduce thrust on the engine and cut off the blue hydraulic system) which temporarily placed him outside the control loop; 8) in addition the absence of pitch attitude protection in the autopilot altitude acquisition mode played a significant role.

The following is also contributed to the accident: 1) The inability of the crew to identify the mode in which the autopilot was placed; 2) the confidence of the crew in the expected reactions of the aircraft; 3) the late reaction from the flight test engineer when faced with a potentially hazardous change in parameters (speed in particular); 4) the time taken by the captain to react to an abnormal situation."

**Sources:**

Scramble 183 + Scramble 184; Flight International 10-16.8.94(6); Aviation Week & Space Technology 11.07.94(26-27) + 3.4.95(72-73) + 10.4.95(60) + 17.04.95(44-45) + 15.05.95(58-59) + 22.05.95(54,56) + 29.05.95(69-70); TT + Ceefax; Air Safety Week 23.01.95(4)

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**Photos**



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