Aviation Safety Investigation Report 198600155

Aerospatiale Puma SA330J

29 December 1986

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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: 198600155 **Occurrence Type:** Accident
Location: 20km NW Karratha WA
Date: 29 December 1986 **Time:** 1003
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None
Crew	0	0	0	0
Ground	0	0	0	-
Passenger	2	5	8	0
Total	**2**	**5**	**10**	**0**

Aircraft Details: Aerospatiale Puma SA330J
Registration: VH-WOA
Serial Number: 1526
Operation Type: Charter (Passenger)
Damage Level: Substantial
Departure Point: North Rankin 'A' Gas Production Platform
Departure Time: 0925 Gas Production Platform
Destination: Karratha

Approved for Release: February 3rd 1988

Circumstances:

During the return flight from the gas production platform, passing 2300 feet on descent into Karratha, the crew and passengers heard a muffled noise from the rear of the helicopter. The aircraft continued the descent in controlled flight for a short period of time before it yawed violently to the left and rolled to approximately 90 degrees of left bank. The co-pilot was flying the aircraft at the time and he lowered the collective lever and placed the aircraft into an autorotational descent. However, the aircraft continued to yaw to the left so the pilot took the controls and with the assistance of the co-pilot a controlled autorotational descent was resumed. The descent continued, during which time the co-pilot carried out a number of actions associated with the loss of some of the aircraft systems and armed the flotation bags. Shortly thereafter, the aircraft again rolled violently to the left to a bank angle of approximately 130 degrees. The pilot was able to regain some control and rolled the helicopter to an upright position, however the descent rate had increased. As a result of the violent yaws, the pilots' headsets were flung from their heads making communications between them extremely difficult. During the final stage of the descent the co-pilot was able to retrieve his headset and broadcast a MAYDAY call which was received by Karratha Control Tower. Just prior to impact with the sea, the pilot pulled on full collective to reduce the descent rate and cushion the landing. The helicopter impacted the surface with a low forward speed and yaw, slightly nose low and banked to the right. The time interval between the first indication of a problem and impact was 45 seconds. Following impact, the aircraft capsized and floated nose low with both the cockpit and cabin doors submerged. The crew and surviving passengers exited the fuselage via windows and doors in the cockpit and cabin areas. However, escape was hampered by the immediate influx of the cloudy seawater and bubbles created in the water. Obstructions in the form of dislodged internal panelling and headset attachment cords also had to be negotiated, and disorientation due to the aircraft's

inverted attitude and its angle of rest, had to be resolved before escape was possible. The co-pilot made two attempts to rescue the two unaccounted for passengers, but the aircraft sank in 13 metres of water before he was able to do so. The recovery team advised that it appeared that the two victims had attempted to escape but failed to reach safety. The 15 survivors were rescued by a small fishing boat that was operating in the area of impact. The bodies of the deceased and the wreckage were recovered later on the day of the accident. Prior to impact with the sea the aircraft had suffered an inflight break up. The break up began when one tail rotor blade failed approximately one third of the way out from the blade attachment point. The loss of this section of the blade resulted in severe out of balance forces which caused extensive damage to the tail rotor, tail rotor gear box and mountings, horizontal stabilizer, vertical pylon, aft section of the tail boom and the tail rotor controls and systems. The blade leading edge spar and skin had suffered from fatigue cracking which significantly reduced the blade's load carrying capacity. The blade failed when the remaining unaffected metal in the leading edge spar and skin could no longer carry the inflight loads imposed on the blade. The fatigue cracking had originated from a small indentation in the rear face of the leading edge spar. The indentation was caused by a misaligned jig key used during the construction of the blade and the damage was not detected by the manufacturer's quality control inspection procedures. The subsequent fatigue cracking of the spar was not discovered by the operator although the inspection procedures used were in accordance with the manufacturer's recommendations. The losses of control during the descent were the result of inflight losses of essential aircraft structure and systems. There was no information available to the crew about the handling characteristics of the aircraft with significant sections of the rear stabilizers missing. The information on the aircraft handling characteristics, during autorotational descent with the flotation system inflated, was contradictory and inconclusive, therefore the pilot elected not to inflate the flotation bags during the descent. The co-pilot had intended inflating the bags just prior to impact, but because of cockpit workload insufficient time was available. The helicopter was not fitted with a system which would automatically activate the flotation bags upon entry into water.