MINISTRY OF DEFENCE
MILITARY AIRCRAFT ACCIDENT SUMMARY

AIRCRAFT ACCIDENT TO ROYAL AIR FORCE PUMA HC1 XW234

AIRCRAFT:	**RAF Puma HC1 XW234**
DATE:	**21 January 2002**
LOCATION:	**Ballykelly, Northern Ireland**
PARENT UNIT:	**230 Squadron, RAF Aldergrove**
CREW:	**Four – pilot, navigator, crewman and u/t crewman**
CASUALTIES:	**Two - one major, one minor**

Issued by: Directorate of Air Staff, Metropole Building, Northumberland Avenue, London, WC2N 5BP

July 2003

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SYNOPSIS

1. On the afternoon of 21 January 2002, Puma HC Mk 1, XW234, left RAF Aldergrove to fly to Ballykelly to pick up a passenger. The aircraft approached Ballykelly with the aim of landing in the vicinity of the refuelling site, in order to refuel before picking up the passenger. As the aircraft positioned to land it began to descend rapidly. Shortly afterwards it impacted heavily with the ground, eventually coming to rest on its starboard side. The crew exited the aircraft with some assistance via the port cabin and cockpit doors. The RAF Board of Inquiry concluded that the reduction in airspeed when turning downwind resulted in a loss of "translational lift"

from the wind. Without an increase in power needed to compensate for this loss, the rate of descent increased and the aircraft crashed.

BACKGROUND

2. The day before the accident (20th January) the crew of XW234 began a period of duty which was to last 21 days. However, due to inclement weather, there was no flying on that day and the crew stood down. On 21st January one of the crew reported for duty at about 1530hrs, and was told that there was a tasking for 1630 hrs. This was unexpected, as no tasking had previously been notified to the crew. The other crew members were called out, reporting for duty at about 1545 hrs.

CIRCUMSTANCES

3. After an expeditious start, XW234 departed to the north-west en-route to Ballykelly. Weather conditions were good, with a moderate south-westerly wind. As the aircraft began its approach to land at Ballykelly a high rate of descent developed and the navigator warned of the high sink rate. A few seconds later, at about 16.45 hours, the aircraft impacted the soft ground close to the edge of a disused runway, in an approximately level attitude. The aircraft pitched forward onto its nose and the main rotor blades struck the ground. The aircraft rotated about its nose and then fell onto its starboard side. Before the aircraft came to rest, the tail-boom broke off. The Crashworthy Auxiliary Fuel Tank System (CAFTS), which was full, became detached from the cabin floor, together with its mountings, coming to rest on top of the crewman.

RESCUE OPERATION

4. During the impact, the crewman was thrown around the cabin sustaining various injuries and becoming trapped under the detached CAFTS. The pilot and u/t crewman freed the crewman from under the CAFTS and all three exited via the port cabin door. The pilot and navigator were subsequently taken to the local medical centre, whilst the two crewmen were taken by ambulance to a local hospital.

5. A Corporal from the Tactical Supply Wing, who was an eyewitness to the accident, came to the aid of the crew, climbing onto the aircraft to help them evacuate. He was commended for significant gallantry for these actions.

INVESTIGATION

6. The Board was hampered by the lack of evidence from either an Accident Data Recorder (ADR) or Cockpit Voice Recorder (CVR). However, using expert assistance from Air Accident Investigation Branch and other specialists, flight instrument malfunction, pilot training, visual illusion, distraction and fatigue were discounted as factors in the accident. The Board concentrated on mechanical failure, the meteorological conditions, aircraft handling issues, and human factors. Following their investigations, the Board concluded that the pilot's lack of recent flying practice, his lack of appreciation of the wind (which was particularly gusty), and time pressure were all contributory factors in the accident.

7. Because the wind was gusty at Ballykelly on the day of the crash, the airspeed could have been anywhere between 33kts and 13kts immediately before the crash. This could have effected the amount of translational lift available to the aircraft. (Translational lift occurs when the aircraft accelerates through an airspeed of approximately 15-20 knots indicated airspeed resulting in a reduction in power required. When airspeed is reduced below this (for example, in the final stages of an approach) a significant increase in power is needed to compensate for the loss of lift.) As mentioned earlier, the Board concluded that the reduction in airspeed resulted in a loss of translational lift. As the aircraft was not far from the ground, an immediate increase in power was needed to compensate. Without this increase, the rate of descent developed, and the aircraft crashed.

SAFETY RECOMMENDATIONS

7. The Board made a number of recommendations, which included:

a. That the Puma HC Mk 1 be fitted with an ADR and CVR.

b. That the method of securing the CAFTS to the floor be redesigned.

c. That aircrew training and currency requirements following absences from flying be reviewed.

d. That procedures for the notification of tasking be reviewed.

8. Comments on the recommendations are as follows:

a. ADR and CVR will fitted to the fleet as part of a Puma modification programme which is due to begin in 2005.

b. The CAFTS mount has been redesigned. A programme to install the modified mounts is currently underway and is expected to complete in Autumn 2003.

c. Navigator training highlights the effects of turning downwind in helicopters. Currency requirements have been reviewed and found to be appropriate.

d. Task Notification procedures have been reviewed and amended; operations staff now have a robust method of notification for tasking, including late notice bids and meteorological warnings.