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Interim Statement 2/2011

Investigation of Helicopter Accident on EA 206A (AgustaWestland AW139 Registration Mark B-MHJ) on 3 July 2010

DATA SUMMARY

Aircraft Type:	AgustaWestland AW139
Registration:	B-MHJ
Year of Manufacture:	2008
Number and Type of Engines:	Two Pratt & Whitney PT6C-67C turbo-shaft engines
Date and Time of Accident:	3 July 2010 at 0400 hours UTC (1200 hours local time)
Place of Accident:	About 370 m north-west of Sheung Wan/ Sky Shuttle Heliport, Hong Kong (VHSS)
Nature of Accident:	Shortly after take-off from Sheung Wan/ Sky Shuttle Heliport (ashore Victoria Harbour) for Macao, B-MHJ ditched into the harbour north-west of the heliport. All crew and passengers onboard survived and were rescued though some of them suffered from minor injuries.
Type of Flight:	Chartered Public Transport
Persons on Board:	Crew: 2 Passenger: 11
Fatalities:	Nil
Serious Injuries:	Crew: Nil Passenger: Nil
Captain's Licence:	Airline Transport Pilot's Licence (Helicopters)
Captain's Age:	45
Captain's Experience:	6,120 hours (of which 350 hours were on type)
Other Crew:	Cockpit: One First Officer Cabin: Nil

All times in this Report are in Coordinated Universal Time (UTC) with Hong Kong Local Time in parenthesis.

1. GENERAL

On 3 July 2010, an AgustaWestland AW139 helicopter, registration B-MHJ, operated by East Asia Airlines[1] and bound for Macao, had an accident shortly after taking off from the Sheung Wan/Sky Shuttle Heliport, ashore Hong Kong Victoria Harbour. The entire tail rotor assembly became detached from the helicopter whilst climbing at an altitude of approximately 350 ft. The pilot was able to put the helicopter into autorotation and make a controlled ditching in Victoria Harbour. All pilots and passengers were rescued by the nearby vessels. The helicopter subsequently overturned and the entire fuselage became submerged but the emergency floats kept the helicopter floating upside down.

In the evening, the wreckage was lifted out of water and positioned to a hangar at the Hong Kong International Airport in the following day. The top section of the vertical tail, the tail rotor, the tail gearbox and the associated drive shaft, control rods and cover fairings of the helicopter were found missing. The tail rotor and tail gearbox were eventually salvaged from the Victoria Harbour on 14 July 2010 but one of the four blades (the White blade) of the tail rotor could not be found. Searching of the White blade and other missing parts mentioned continued until the last attempt made on 3 November 2010 but without success.

The accident investigation was being conducted under the control and direction of the Civil Aviation Department (CAD) with the assistance of the Civil Aviation Authority of Macao Special Administrative Region, Agenzia Nazionale per la Sicurezza del Volo (ANSV) of Italy, Air Accidents Investigation Branch (AAIB) of the United Kingdom, National Transportation Safety Board (NTSB) of the United States of America and AgustaWestland (AW), the helicopter manufacturer.

2. HISTORY OF THE FLIGHT

On 3 July 2010, the accident flight EA 206A was operated by two pilots with 11 passengers onboard. The gross weight of the helicopter before take-off was calculated as 5,971 kg, which was within the Maximum Gross Weight for take-off/landing of 6,400 kg for the helicopter. The helicopter was within

[1] East Asia Airlines is a helicopter operator established in Macao. It provides chartered passenger service between Macao and Hong Kong.

both longitudinal and lateral centre of gravity limits.

The helicopter took off from Sheung Wan/Sky Shuttle Heliport in Hong Kong at 0400 hours (1200 hours). The departure was uneventful. The flight was conducted under Visual Flight Rules, which required the pilot to remain clear of cloud and in visual contact with the surface. At the time of the accident, the wind speed was 7 kts at a direction of 255 degrees. The visibility was more than 10 km.

The captain was the 'pilot flying' in the right seat. The first officer was the 'pilot not flying' in the left seat. After departing from the heliport, the helicopter was climbing on a north-westerly heading. When passing approximately 350 ft at about 70 kts, the crew had completed the post-takeoff checks. Shortly afterwards, both pilots heard a loud bang from the rear of the helicopter and felt airframe vibrations. At the same time, the captain found that he had no authority on the pedal controls and determined that the tail rotor of the helicopter had failed. Immediately, the captain put the helicopter into autorotation. Whilst in autorotation, he commanded the first officer to shut down both engines in accordance with the emergency procedures and the first officer carried out the commands accordingly. Also, the captain transmitted a 'MAYDAY' call. The captain made a controlled ditching with the helicopter maintained in level attitudes and low forward speed at touchdown. Once the helicopter touched the water, all the four emergency floats were inflated automatically. The time between the loud bang heard by the pilots and the touchdown on water was about 16 seconds.

After the helicopter was floating firmly on water, both pilots exited the cockpit expeditiously through the emergency exits on their respective cockpit doors. The captain then opened the starboard passenger door from outside. Both pilots instructed and assisted the passengers to evacuate from the helicopter. After ensuring that nobody was left onboard, the captain left the helicopter. The helicopter remained afloat for approximately 18 minutes before overturning due to the failure of the forward right emergency float. Partial deflation of the forward left emergency float was also noticed.

The 11 passengers were taken to hospital for medical examination. Six passengers received treatment for minor injuries. All passengers were discharged from hospital on the same day.

3. AIRCRAFT INFORMATION

The AgustaWestland AW139 helicopter holds a Type Certificate EASA.R.006 issued by the European Aviation Safety Agency. The helicopter of Serial Number 31222 was delivered following manufacture to the owner and registered in Macao Special Administrative Region on 22 January 2009. The Certificate of Airworthiness of the helicopter was valid and the total aircraft hours recorded was 1467:36 hours.

The helicopter was equipped with two Pratt & Whitney PT6C-67C engines. Engine No. 1 of Serial Number KB0456 and Engine No. 2 of Serial Number KB0452 were installed new on the helicopter. No abnormalities of engine operation were reported prior to the accident.

4. FLIGHT RECORDER AND HUMS

The helicopter was equipped with a Penny & Giles Aerospace Limited Solid State Multi Purpose Flight Recorder, of Model D51615-102, that recorded both flight and cockpit voice data.

The recorder was extracted on helicopter recovery and did not exhibit any impact damage externally.

The readout of the recorder was performed on 5 July 2010. Flight parameters were obtained without any problems and the channels containing the cockpit voice recording were downloaded, thus providing investigators with the flight data and communications for the complete flight and, specifically, at the time of the accident.

The Health and Usage Monitoring System (HUMS) memory card installed on the helicopter was extracted and sent to AAIB for analysis. However, the retrieval of the data from the memory card was unsuccessful due to the corrosion of chips inside the memory card likely caused by sea water ingress.

5. INVESTIGATION

Inspection of the wreckage was performed by both CAD and the helicopter manufacturer. Apart from the damages located at the vertical tail section and the horizontal stabiliser areas, impact damages were also found which included the loss of left-hand nose window transparency panel on the forward fuselage and the break-off of two air scoops from the bottom rear fuselage.

The damage to the vertical tail section appeared to be consistent with the effect of high vibration of tail rotor under power whilst the damages on the horizontal stabiliser could be consequential damages resulted from the departed tail rotor.

Analysis of the flight data revealed that the engines were operating with the required power at the time of accident and ruled out the mechanical failure of any engine component.

The investigation on recovered parts was being carried out with the assistance from the helicopter and component manufacturers, and their respective investigating authorities. The tail rotor assembly and the fractured parts of the vertical tail section were sent for detailed forensic structural inspection and analysis. The report was being awaited.

Two damaged tail rotor blade lag dampers removed from the tail rotor assembly were sent to the manufacturer for investigation. The manufacturer reported that the elastomeric elements on the dampers appeared to be serviceable.

Both forward emergency floats were investigated by the manufacturer. The investigation revealed that with the loss of the tail rotor and the reduced self-buoyancy of the helicopter cockpit due to sea water ingress, the loss of balance of the helicopter had overloaded the floats. Besides, evidence showed that the bonding of the patches on the main vessel of the floats was the starting point of the failure.

An unused life jacket recovered from the helicopter, the vacuum seal of which was found torn, was sent to the manufacturer for investigation. The manufacturer had provided CAD with the findings of the investigation. These findings are being analysed by CAD.

6. STATUS OF THE INVESTIGATION

The accident investigation is on-going and focusing on the cause of out-of-balance tail rotor operation, in particular the failure of the White blade that might have resulted in high vibration that ruptured the upper section of the vertical tail from the helicopter.

Issued on 29 June 2011

This Interim Statement contains facts relating to the accident as determined up to the time of issue. The information must be regarded as tentative and subject to alteration or correction if additional evidence becomes available.