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Accident Bulletin 4/2011

(An update to Accident Bulletin 2/2010 and Interim Statement 2/2011)

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 370m 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.
Type of Flight:	Chartered Public Transport
Persons on Board:	Crew: 2 Passenger: 11
Fatalities:	Nil
Serious Injuries:	Crew: Nil Passenger: Nil
Commander's Licence:	Airline Transport Pilot's Licence (Helicopters)
Commander's Age:	45
Commander's Experience:	6,120 hours (of which 350 hours were on type)
Other Crew:	Cockpit: One Co-pilot Cabin: Nil

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

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

The Civil Aviation Department of the Government of the Hong Kong Special Administrative Region (CAD) issued Accident Bulletin 2/2010 and Interim Statement 2/2011 on 27 July 2010 and 29 June 2011 respectively on the investigation of the accident on East Asia Airlines EA 206A on 3 July 2010. This Accident Bulletin provides further available information as the investigation progresses.

Focus of Investigation

2. After the accident, the tail rotor and tail gearbox assembly detached from the helicopter was salvaged from the Victoria Harbour. However, a major portion of a tail rotor blade, designated as White Blade, was found broken off from the tail rotor. The breakage occurred at the blade root area, leaving behind a short U-shaped portion of the blade remained attached to the tail rotor hub. The broken portion of the White Blade could not be recovered. The focus of the investigation is to identify the circumstances leading to the breakage of the White Blade and the detachment of the tail rotor and tail gearbox assembly.

Forensic Engineering Analysis

3. The White Blade is constructed of composite materials. After the accident, CAD contracted QinetiQ, a defence technology agency in the United Kingdom with expertise in forensic engineering of aircraft composites, to perform the necessary tests and examination of the salvaged tail rotor and tail gearbox assembly, and the fractured part of the vertical tail section. In September 2010, the investigation team held a meeting at the Air Accidents Investigation Branch (AAIB) of the United Kingdom, attended by CAD, AAIB, Civil Aviation Authority of Macao Special Administrative Region (AACM), Agenzia Nazionale per la Sicurezza del Volo (ANSV) of Italy, AgustaWestland and QinetiQ. The meeting defined the scope of work to be undertaken by QinetiQ on the salvaged parts.

4. The scope of work examined by QinetiQ focused on the tail rotor hub, the remained portion of the White Blade, the Blue Blade, Yellow Blade and the fractured part of the vertical tail section. Specialised techniques such as Scanning Electron Microscope Inspection, X-ray Tomography, Differential Scanning Calorimetry and

Burn-off Test, etc., were applied when necessary.

5. QinetiQ submitted the examination report (the QinetiQ Report) to CAD in July 2011. After a detailed review of the QinetiQ Report, CAD noted that the examined samples of the Blue Blade, Yellow Blade and the remained portion of the White Blade indicates that these blades did not comply fully with AgustaWestland's specifications. Manufacturing discrepancies such as undersize and high level of porosity of the upper and lower straps of the blade samples were identified.

AW139 Accidents in Qatar and Brazil

6. On 2 May and 19 August 2011, there were two AW139 accidents occurred in Qatar and Brazil respectively. The preliminary information of these two accidents indicated tail rotor blade breakage and tail rotor detachment, very similar to that of B-MHJ. These accidents are being investigated by the respective Qatar Civil Aviation Authority (QCAA) and Centro de Investigacao e Prevencao de Acidentes Aeronauticos (CENIPA), along with ANSV.

7. Subsequent to the accident in Qatar, the European Aviation Safety Agency (EASA), the Type Certification Authority of AW139 helicopters, have issued Airworthiness Directive (AD) 2011-0081 on 9 May 2011 to require the inspection of AW139 tail rotor blades of prescribed part numbers at intervals not exceeding 25 Flight Hours in accordance with the instructions of BT 139-251 published by AgustaWestland. After the accident in Brazil, EASA further issued AD 2011-0156-E on 25 August 2011 to additionally require the replacement of AW139 tail rotor blades of prescribed part numbers after the blades have accumulated or exceeded 600 Flight Hours or 1500 Flight Cycles in accordance with the instructions of BT 139-265 published by AgustaWestland.

Information Exchange with Other Parties

8. During the course of the B-MHJ investigation, CAD have maintained close coordination with EASA, ANSV and AgustaWestland and provided the latest investigation information to the parties concerned. After the two AW139 accidents in Qatar and Brazil, CAD have also shared the relevant information with the local investigation authorities in a timely manner. CAD will continue to liaise with these parties on the investigation and the sharing of information in the interest of safety.

9. On 17 to 19 October 2011, ANSV hosted a meeting at Rome that also involves CAD, AACM, QCAA, CENIPA, EASA, Ente Nazionale per l'Aviazione Civile (ENAC) of Italy and AgustaWestland. The objectives of the meeting are to facilitate technical information exchange, experience sharing and more comprehensive understanding of the circumstances leading to the occurrence of the three AW139 accidents in Hong Kong, Qatar and Brazil where similar evidence of tail rotor blade breakage and tail rotor detachment was found.

Further Analysis and Investigation

10. CAD considered that the manufacturing process of the AW139 tail rotor blades should be reviewed in light of the discrepancies identified by QinetiQ. Also, further static, fatigue, dynamic and aerodynamic tests and analyses would be required to determine the cause of the breakage of the White Blade and the detachment of the tail rotor and tail gearbox assembly. The performance of these review, tests and analyses will require reference to proprietary and confidential manufacturing, design and certification data of AW139 helicopters which are maintained by AgustaWestland (the manufacturer of AW139 helicopters), ENAC (the Competent Authority responsible for the Production Approval of AgustaWestland) and EASA (the Type Certification Authority of AW139 helicopters). While the investigation is on-going and without prejudicing its final conclusions, the investigation team considers necessary to issue the following Recommendations:

Recommendation 2011-3:

Ente Nazionale per l'Aviazione Civile, jointly with AgustaWestland, to review the manufacturing process of the AW139 tail rotor blades to determine the causes of the discrepancies identified in the QinetiQ Report and evaluate their effects.

Recommendation 2011-4:

European Aviation Safety Agency to require AgustaWestland to perform static, fatigue, dynamic and aerodynamic tests and analyses on AW139 tail rotor blades so as to minimise the possibilities of tail rotor blade failure which could have been caused by one or the combination of these effects.

If during the course of the investigation, further safety recommendation is considered necessary, it will be issued immediately.

Issued on 18 November 2011

This Accident Bulletin 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.