

JOINT INSTITUTION OF MECHANICAL ENGINEERS HONG KONG BRANCH
WITH ASSOCIAÇÃO DOS ENGENHEIROS DE MACAU
TECHNICAL VISIT TO SKYTEC ON 1/8/2015



General

Hong Kong and Macau are linked together by a frequent passenger ferry service. Round the clock a ferry departs Hong Kong Macau Ferry Terminal on Hong Kong Island and Macau Maritime Terminal in Macau respectively and sails to the other port in about one (1) hour. Even so, some people may consider too lengthy in time and they would pursue even quicker means to reach the opposite city. This gives an opportunity to the premium express service for serving these niche individuals, and helicopter shuttle, operated exclusively by Sky Shuttle Helicopters Limited (SSH), is a solution.

At the roof-top of Hong Kong Macau Ferry Terminal is the aluminium-structured dual-pad heliport of SSH, with one (1) each in the east and west respectively linked by two (2) parallel avenues. On Macau side, at the roof-top of Macau Maritime Terminal is a dual-pad heliport with three (3) parking spots and facilities for refuelling the helicopters with Jet A1 fuel. Ground and air traffic control of both helipads are manned and operated by SSH, making SSH a fully integrated helicopter operator. 40 flight departures from one helipad to another takes 15 to 18 minutes from 10:00 to 22:59 daily, whereas the night flight of the six (6) departures between Macau Maritime Terminal and Shenzhen Baoan International Airport takes 25 minutes instead of 15 at day-time. Such high frequency of turn-over ranks SSH fleet of five (5) Leonardo Helicopters (AW139) helicopters one of the top 10 in the global AW139 flight hour league.



Overview

SSH started in July 1988 with the formation of East Asia Airlines (EAA) in Macau, which was granted Air Operator Certificate (AOC) of both Hong Kong and Macau in November 1990. EAA initially operated two (2) Bell 222 helicopters between Hong Kong Macau Ferry Terminal and Macau Maritime Terminal (also known as Outer Harbour Pier), whereas following the registration of Helicopters Hong Kong Limited (HeliHK) in Hong Kong in 1997 which partnered with EAA, in 1998 saw the migration of fleet from Bell 222 to Sikorsky S76C+. The service between Outer Harbour Pier and Shenzhen Airport was added in 2002, and the services of EAA and HeliHK partnership were rebranded to become HeliExpress. Four (4) years later, in 2009 HeliExpress was rebranded to become SSH and was introduced AW319 to the fleet which replaced the Sikorsky units. The fleet of exclusively five (5) AW139 helicopters reached 10,000 flight hours in 2011, and 20,000 flight hours in 2013, when EAA celebrated its silver jubilee. In 2015, the fleet has accumulated over 30,000 flight hour.

In parallel to EAA's operation between Hong Kong and Macau in 1990, in the same year maintenance started at the hanger on Coloane in Macau. In consolidating maintenance of helicopters registered in Hong Kong and Macau, AirTech was established in 1999 which was rebranded to become SkyTech Aircraft Engineering Limited (SkyTech) in January 2010. Today, SkyTech provides complete AW139 maintenance support for East Asia Airlines and Sky Shuttle Helicopters. They hold Macau MAR-145 and Hong Kong HKAR-1 maintenance approvals that are accepted under the Joint Maintenance Management (JMM) arrangement.



Maintenance and Aviation Regulations

JMM is a joint agreement among Civil Aviation Department of Hong Kong (HKCAD), Autoridade de Aviação Civil de Macau (AACM, Civil Aviation Authority of Macau) and General Administration of Civil Aviation of China (CAAC) to regulate and recognise aircraft maintenance across the region, ensuring uniformity in laws, rules and standards to permit the maintenance and release of an aircraft under a single civil aviation approval. SkyTech is granted MAR-145 by AACM, which closely mirrors the standards and requirements produced by European Aviation Safety Agency (EASA) and Hong Kong, under JMM Acceptance Number of JMM-020, permitting SkyTech to repair rotorcrafts accepted by three administrations.

Part-145 means an approved Aircraft Maintenance Organisation for transport-type aircraft, and MAR-145 granted to SkyTech closely mirrors the regulatory requirements of EASA Part-145, which governs the continuing airworthiness of aircraft and aeronautical products, parts and appliances, as well as on approval of organisations and personnel involved in these tasks under Commission Regulation (EU) No. 216/2008 (the latest 1321/2014). The compliance of SkyTech with MAR-145 is audited by AACM and SkyTech own Safety and Quality Assurance Department.

SkyTech employs 25 licensed rotorcraft engineers, 12 rotorcraft mechanical 18 management and technical support staffs who are all based in Macau. Its engineers hold Aircraft Maintenance License issued by both HKCAD and AACM qualified in Mechanical Stream (B1.3 of MAR-145, B1.3 Engineer) and Avionics Stream (B2 of MAR-145, B2 Engineer). They receive aircraft type training and continuous training on technical, airworthiness procedures and human factors. Under B1.3 Engineer and B2 Engineer are Mechanics and Senior Avionics Mechanics, and above is Engineer Supervisor, followed by Deputy Maintenance Manager, Maintenance Manager.

Maintenance Manager, together with Quality Assurance Manager and Technical Services Engineering Manager, are responsible to Director, Flight & Engineering.

SkyTech sources consignment stock directly from Leonardo Helicopters and purchases parts received with Authorised Release Certificates, such as EASA Form 1 and FAA 8130-3, declaring the airworthiness of new aviation products, parts and appliances, from either original equipment manufacturer or appropriately approved supplier. The parts are stored in temperature- and humidity-controlled warehouse, while all scheduled maintenance of the SSH fleet is performed at SkyTech dedicated maintenance facility on Coloane, with purpose-built staging and special tooling provided for optimum maintainability and achieving full adherence to the manufacturers servicing recommendations, mandatory service bulletins and EASA airworthiness directives.

SkyTech holds a maintenance review board meeting with SSH to review and discuss all regulatory, mandatory and non-mandatory technical issues, including the quarterly evaluation of maintenance and reliability statistics, where component reliability is recorded and analysed. Moreover, on top of those already mandated by Leonardo Helicopters, EASA and AACM, over 50 additional maintenance tasks have been approved and implemented in the aircraft maintenance schedule in delivering proactive safety enhancement.



Aircraft

AW139, made of composite skin and aluminium alloy structure, equips with two (2) Pratt & Whitley Canada PT6C-67C turbo-shaft engines, which 1,679 shaft horsepower delivers maximum cruise speed of 165 knots (306 km/h) at 1,000 feet (about 30.5 m) altitude. Its fuel tank is sufficient to sustain three (3) hours of flight for around 675 nautical miles (1,250 km). At 5 tonnes self-weight, each AW139 carries two (2) pilots and maximum 12 people in the air-conditioned passenger compartment.

Notwithstanding 10,000 flight hours of design life, out of five (5) AW139 helicopters in SSH fleet, which three (3) of them are registered in Macau and two (2) are in Hong Kong, three (3) helicopters have logged 8,000 flight hours, while two (2) units have reached 6,000 flight hours.

Given the unique and demanding operating conditions, especially frequent take-off and landing, Leonardo Helicopters has referenced SSH for research on design and operability of AW139 helicopters. For instance, fatigue test which Leonardo Helicopters conducted on the SSH units revealed the weakest point of the fuselage appeared at the tail. In turn, Leonardo Helicopters has predefined overhaul and maintenance regime for every 50 flight hours, 100 flight hours and up to 1,200 flight hours, which is duly undertaken by SkyTech.



Remark

Though the connection between Hong Kong and Macau and Macau and Shenzhen Airport by helicopter is known in the region, the engineering and the associated regulations in warranting safety may have been less appreciated. The joint technical visit of Institution of Mechanical Engineers Hong Kong Branch (IMechE-HKB) and Associação de Engenheiros de Macau (AEM) to SkyTech on 1st August, 2015 has provided 15 privileged members of both organisations a rare opportunity to be enlightened first-hand with the world of rotorcraft aviation in Pearl River Delta Region of China. Travelling between these cities by air is in good hands.

IMechE-HKB and AEM thank Mr. Raymond Yum and his colleagues for their hospitality in the visit.

WHT

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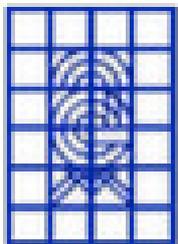


**IMechE Hong Kong Branch – Macau Subcommittee and Young Member Section
Jointly Organize with The Macau Institution of Engineers**

TECHNICAL VISIT



**Institution of
MECHANICAL
ENGINEERS**



SkyTech Aircraft Engineering Limited maintains a fleet of modern AW139 twin-engineered helicopters for both Sky Shuttle Helicopters and East Asia Airlines on an around-the-clock, 24-hours basis.

In this visit, participants can have a detailed understanding of the helicopter maintenance industry in Macau, and will have a chance to look at the daily operations of a helicopter maintenance facility.

Date:	1 August 2015
Time:	9:00am to 12:00noon
Venue:	SkyTech Aircraft Engineering Limited (Macau)
Gathering time:	7:00am (Hong Kong) 8:45am (Macau)
Gathering venue:	Hong Kong Macau Ferry Pier (Hong Kong) Taipa Ferry Pier (Macau)
Fee:	Free (excluding ferry ticket)
Capacity:	6 (for IMechE member)

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