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AgustaWestland AW139

AW139

Italian Helicopter HH139, Trident Juncture 15 (cropped).jpg

An Italian Air Force HH-139 at Trident Juncture 15

Role- Medium-lift SAR/utility helicopter

Manufacturer- AgustaWestland

First flight- 3 February 2001

Introduction- 2003

Status- In production

Primary users- Italian Air Force

-CHC Helicopter

-Irish Air Corps

-UAE Air Force

Produced- 2001-present

Number built- 900+ as of 2018[1]

Unit cost

$12 million

Developed into- AgustaWestland AW149

The AgustaWestland AW139 is a 15-seat medium-sized twin-engine helicopter developed and produced principally by AgustaWestland. It is marketed at several different roles, including VIP/corporate transport, offshore transport, firefighting, law enforcement, search and rescue, emergency medical service, disaster relief, and maritime patrol. In addition to AgustaWestland's own manufacturing facilities in Italy and the United States, the AW139 is produced in Russia by Heli Vert, a joint venture between AgustaWestland and Russian Helicopters.

The AW139 was originally designed and developed jointly by Agusta and Bell Helicopters and marketed as the Agusta-Bell AB139, being predesignated AW139 when Bell withdrew from the project. Since entering service in 2003, the AW139 has become one of AgustaWestland's most influential products; it has been subsequently developed into two enlarged medium-lift helicopters, the military-orientated AW149 and the AW189 for the civil market.

Development

Origins

A corporate transport AW139

In 1997, the Italian helicopter manufacturer Agusta launched a programme to develop a replacement for the Bell Huey family of helicopters (which had been built in very large numbers by Bell Helicopter and under license by Agusta) with a potential market of 900 aircraft being predicted. In 1998, Bell and Agusta entered into an agreement, setting up a joint venture, Bell/Agusta Aerospace Company (BAAC), to develop two aircraft: a conventional helicopter and a tiltrotor aircraft. These became the Bell/Agusta AB139 and Bell/Agusta BA609 respectively. Bell was to be the leading partner for the development of the BA609 while Agusta would be the lead partner for the AB139; it was intended for production, sales, and support to be shared.

On 26 September 2000, the first order for the type was placed by Bristow Helicopters. The first preproduction helicopter flew on 3 February 2001 at Virgate in Italy, with two further AW139s also participating in flying trials. The first production AW139 made its first flight on 24 June 2002. European JAA certification was received in June 2003, and its FAA type certificate followed in December 2004. By May 2005, the AW139 had received in excess of 100 orders worldwide. In the US, the type was marketed under the designation US139, and was entered into the US Army's Light Utility Helicopter competition. One key market for the AW139 was the oil & gas industry, which required helicopters of increased endurance for offshore operations. In 2005, AgustaWestland bought out Bell's 25% share in the program and all of its rights to the AW139 for $95 million.

In April 2008, AgustaWestland revealed that it was in the process of certifying an increase in the AW139's max gross weight to 14,991 lb (6,800 kg) to better compete in long-range markets served by helicopters such as the larger Sikorsky S-92 and Euro copter EC225. In 2007, a second production line at the AgustaWestland Aerospace plant in Philadelphia, United States was established; the Philadelphia plant produced its 200th AW139 in September 2014, at which point U.S. production was intended to reach 40 units per year in the near future. By 2011, AgustaWestland was producing 90 AW139s a year; 9.5% of the company's overall revenue in 2010 was attributed to the type. By 2013, a combined total of 720 AW139s had been sold to over 200 operators in 60 different countries.

Further development

The AW139 has a five-blade main rotor and retractable undercarriage

In 2011, a military-configured variant, the AW139M, was revealed by AgustaWestland. It was promoted at the US market, including for the U.S. Air Force's Common Vertical Lift Support Program. The AW139M is equipped with a high definition forward-looking infrared (FLIR), self-protection system, heavy-duty landing gear, and has low thermal and acoustic signatures; a significant proportion of the equipment is sourced from American manufacturers. Options offered include an external stores system including various armaments, armoured seats, self-sealing fuel tanks, and a full ice-protection system for all-weather operations.

The AW139 serves as the basis for AgustaWestland's wider business strategy, under which it aims to produce a standardised family of helicopters with common design features. The sharing of components and design philosophies is intended to simplify maintenance and training for operators; commonality also lowers the production costs. The AW139 was the first of this group, and as of 2014, it was to be joined by the larger AW149 and AW189, aimed at military and civilian customers respectively. Advances made in the development of new models are intended to be transferrable onto existing family members, decreasing the cost of future upgrades for the AW139.

In June 2010, it was announced that AgustaWestland and Resveratrol would build a manufacturing plant in Tomi lino, Moscow Region, where it was initially planned to produce AW139s by 2012. Heli Vert, a joint venture between AgustaWestland and Resveratrol, commenced domestic production of the AW139 in 2012, at which point it was planned that between 15 and 20 helicopters would be produced per year. The first AW139 to be assembled in Russia made its first flight in December 2012. In January 2013, the Russian Defence Ministry was reportedly considering placing an order for seven AW139s. In January 2014, Heli Vert received a Certificate of Approval from the Aviation Register of the Interstate Aviation Committee to commence production of commercial AW139s. In September 2014, a certificate was granted to perform comprehensive maintenance and servicing of the type at the Tomi lino facility.

In 2015, AgustaWestland unveiled an AW139 variant with an increased gross weight of 7 tonnes, enabling a range of 305 km while carrying 12 passengers; existing AW139s can also be rebuilt to the newer heavy-weight model. The heavier airframe comes at the expense of decreased hot and high performance. In November 2015, AgustaWestland demonstrated a 60-minute "run-dry" test (no oil) of an AW139's main gearbox, 30 minutes greater than any other certified rotorcraft at the time.

AgustaWestland has also developed a smaller derivative, the AW169.

Design

Instrument panel of the AW139

The AW139 is a conventional twin-engine multi-role helicopter. It has a five-bladed fully articulated main rotor with a titanium hub and composite blades and a four-bladed articulated tail rotor. It is fitted with retractable tricycle landing gear, the two aft wheels retracting into external sponsors which are also used to house emergency equipment. It is flown by a crew of two pilots, with up to 15 passengers accommodated in three rows of five. The AW139 had been aimed at a vacant niche in the market, sitting below larger types such as the Euro copter AS332 Super Puma and Sikorsky S-92, and above smaller ones like the Bell 412 and Euro copter EC155. rotor & Wing has described the AW139's flying attitude as 'docile and predictable'.

The AW139 is powered by two FADEC-controlled Pratt & Whitney Canada PT6C turboshaft engines; the FADEC system seamlessly adjusts the engines for pilot convenience and passenger comfort, and can automatically handle a single-engine failure without noticeable deviation. It was constructed with maintenance requirements in mind; critical systems can be readily accessed, where possible the number of parts has been reduced, and many components have been designed for an extended lifecycle; a Health and Usage Monitoring System (HUMS) is also equipped. In excess of a thousand customizable items of equipment can be configured per customer demand, including auxiliary fuel tanks, rescue hoists, cargo hooks, search and weather radar, ice protection systems, external cameras and search lights, and seating arrangements.

The AW139 features a modular glass cockpit, a commonly-installed feature being the four-axis autopilot, which enables functions such as auto-hover capability. The cockpit has been designed to enable single-pilot flight operations under instrument flight rules conditions, and it is also compatible with the use of night vision goggles. Pilot training for the type is available via advanced Level D Full Flight Simulators. According to Shipping & Marine, the AW139 has "the largest cabin in its class"; containing up to 15 passengers or four litters and accompanying medics, an additional baggage compartment is used to stow equipment to keep the main cabin clear for use.

Large sections of the AW139 have been developed and produced by a range of different companies. Airframes are typically produced by PZL-Świdnik, who delivered their 200th airframe in April 2014. Pratt & Whitney Canada produce the type's PT6C turboshaft engines, while the primary and secondary transmissions were developed by Westland GKN and Kawasaki Heavy Industries respectively. A significant portion of the avionics are sourced from Honeywell. Turkish Aerospace Industries has been subcontracted to manufacture various elements of the AW139, including the fuselage, canopy, and radome. Final assembly of most AW139s is performed at AgustaWestland's facilities in Philadelphia, United States, and Virgate, Italy; those destined for customers within the Commonwealth of Independent States are typically assembled by a third final manufacturing plant in Tomi lino, Moscow operated by Heli Vert.

Operational history

A SASEMAR AW139 during a Heli hoisting exercise

The Irish Air Corps was the first military operator of the type, having taken delivery of its first AW139, of a batch of six, in August 2006. The United Arab Emirates Air Force and the Qatar Air Force became the second and third military operators of the AW139, having ordered 9 and 18 of the type respectively. A specialised military variant, the AW139M, was later launched, for which the Italian Air Force was the launch customer. Designated as HH-139A in Italian service, they are used for combat search and rescue (CSAR) operations. In October 2012, the Royal Thai Army ordered a pair of AW139s; a further eight were produced in October 2015.

In February 2006, Mitsui Bussan Aerospace signed a $100 million contract for 12 AW139s and an exclusive distribution agreement for the AW139 in Japan. In October 2006, the Japan Coast Guard announced its selection of the AW139 as the replacement for its Bell 212 search and rescue fleet; by early 2011, 18 AW139s were on order by the Japan Coast Guard through Mitsui Bussan as the distributor, a total of 24 are expected to be ordered. The Japanese National Police Agency placed multiple orders for the AW139; other organisations in the nation have used the type for firefighting and disaster relief operations.

In the North American market, CHC Helicopter was the first operator of the type. In 2012, CHC became the largest operator of the AW139 in the world, at that point operating a fleet of 44 in search and rescue, emergency medical service and offshore transport missions. In 2015, responsibility for the maintenance of CHC's AW139 fleet was reorganized under their helicopter support division, Heli-One; activities include post-delivery modifications and engine overhauls.

Orange AW139 air ambulance

Qatar-based firm Gulf Helicopters has emerged as one of the largest AW139 operators worldwide, first ordering the type in 2007 for offshore transport duties; it has since become an authorized service centre and training centre for the AW139. Malaysian operator West star Aviation has the distinction of being the biggest operator of the AW139 in the Asia Pacific; as of February 2014, the company has ordered a total of 34 helicopters. Since taking delivery of their first AW139 in December 2010, West star has typically employed the type in support of offshore oil and gas operations.

In July 2014, AgustaWestland announce that the global fleet had accumulated in excess of one million flight hours; by this milestone, a total of 770 AW139s had been produced.

On 24 May 2016, AgustaWestland parent Leonardo-Finmeccanica announced that Pakistan had signed a contract for an undisclosed number of AW139s as part of a fleet renewal programme spread over several batches, including a logistic support and training package. The AW139s, deliveries of which are expected in 2017, will be used to perform search-and-rescue (SAR) operations across the country. A total of 11 AW139s are already in service in Pakistan, with five aircraft operated for government relief and transportation duties.

On 24 September 2018, the United States Air Force announced that the MH-139 (an AW-139 variant) had won a competition to replace the Air Force's Vietnam-era UH-1Ns. The Air Force will buy up to 84 MH-139s, with initial delivery set for 2021.

Variants

AB139

-Original Italian-built production aircraft, 54 built.

AW139

-Designation change from 55th aircraft onwards, built in Italy.

AW139 (long nose configuration)

-Long nose variant with increased room for avionics built in Italy and the United States.

AW139M

-Militarised variant, capable of carrying various weapons payloads.

HH-139A

-Italian Air Force designation for ten search-and rescues configured AW139Ms.

VH-139A

-Italian Air Force designation for two VIP configured AW139s.

Boeing MH-139

-Military variant based on the American-built AW139.

To replace the United States Air Force's UH-1N fleet with the first four helicopters to be delivered in 2021.

Operators

The AW139 is popular for all types of operators both commercial and private.

Military operators

Cypriot AW139 departs the USS Stout

Algeria

-Algerian Air Force

-Algerian Navy

Bangladesh

-Bangladesh Air Force

Cyprus

-Cyprus Air Force

Egypt

-Egyptian Air Force

Ivory Coast

-Ivory Coast Air Force

And more

Notable accidents

On 21 January 2010, Spanish Maritime Safety Agency AW-139SAR (registration EC-KYR), crashed into the sea close to Almeria. Three people died.

On 23 February 2011, South Korean Coast Guard AW139 went missing off the southern island of Jeju. Five people died.

On 13 March 2014, Hughey Air AW139 (registration G-LBAL) crashed shortly after take-off from Gillingham, Norfolk, United Kingdom, killing all four people on board.

On 26 December 2015, Société Beni noise des Hydnocarpates AW139 (registration: TY-ABC) hit a wall during a forced landing, with the Beninese Prime Minister Lionel Zinsou on board. Everyone walked away from the incident.

On 8 September 2016, a Kenya Police helicopter (registration 5Y-NPS) crashed while on patrol in Mathare North area of Nairobi. All three pilots on board, including an AgustaWestland instructor, escaped with injuries.

On 24 January 2017, an AW139 HEMS helicopter (registration EC-KJT) crashed on a mountain ridge in adverse weather conditions with poor visibility near Campo Felice (province of L'Aquila, central Italy). The rescue helicopter recovered an injured skier in the nearby ski resort and crashed shortly after take-off; after inadvertent entry into IMC, the pilot's loss of situational awareness resulted in a partially-controlled flight into terrain. All 6 people on board (pilot, HEMS crewmember/hoist operator, medic, flight nurse, rescuer and patient) died .

Specifications (AW139)

AW139 with engine doors, main gearbox sliding fairing and nose cowling opened.

Data from AgustaWestland, EASA, Gazette and Maggiore

- General characteristics
- Crew: one or two
- Capacity: 15 passengers
- Length: 16.66 m (54 ft 8 in)
- Main rotor diameter: × 13.80 m (45 ft 3 in)
- Width: 2.26 m (10 ft 0 in)
- Height: 4.98 m (16 ft 4 in)
- Gross weight: 6,400 (7,000kg for 7t version) kg (14,110 lb)
- Powerplant: 2 × Pratt & Whitney Canada PT6C-67C turboshaft engine, 1,142 kW (1,531 hp) each

- Performance

- Maximum speed: 310 km/h (193 mph)

- Cruising speed: 306 km/h (191 mph)

- Range: 1,061 km (659 miles)

- Endurance: 5 hours 13 min

- Service ceiling: 6,096 m (20,000 ft)

- Rate of climb: 10.9 m/s (2,140 ft/min)

References

https://en.wikipedia.org/wiki/AgustaWestland_AW139#Development

www.bjtonline.com

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