



**Government of India**  
**Ministry of Civil Aviation**  
**Aircraft Accident Investigation Bureau**

**Interim Report: Accident involving Helicopter Augusta AW109 of M/s Heritage Aviation Pvt Ltd bearing registration VT-EVV at Bavdhan, Pune on 02 Oct 2024**

**1. General Information**

1.	Aircraft	Type	Augusta Westland AW109S Grand
		Nationality	Indian
		Registration	VT- EVV
2.	Owner		M/s Heritage Aviation Pvt Ltd
3.	Operator		M/s Heritage Aviation Pvt Ltd
4.	Pilot Flying		ATPL(H)
	Extent of Injuries		Fatal
5.	Pilot Monitoring		CPL(H)
	Extent of Injuries		Fatal
6.	Passengers on Board		01 (Duty AME)
	Extent of Injuries		Fatal
7.	Date & Time of Accident		02 Oct 2024, 0154 UTC
8.	Place of Accident		Bavdhan, Near Pune
9.	Last point of departure		Oxford Golf Course Helipad, Pune
10.	Intended place of landing		Juhu Airport
11.	Type of Operation		NSOP
12.	Phase of operation		Take-off

**2. Aircraft Information**

**2.1 Augusta Westland AW109S Grand.** Augusta Westland AW109S Grand is a lightweight, twin-engine, multipurpose Helicopter built by the M/s Augusta Westland (now M/s Leonardo). The helicopter is installed with two Pratt & Whitney PW207C engines. The helicopter has a single main rotor having four composite blades with fully articulated main rotor. The tail rotor blades are made of Composites. The helicopter has dual hydraulic system, dual electrical system and independent lubrication system for main transmission and engines. The fuselage is made of aluminium alloy with bonded honeycomb panels. The helicopter has avionics with day, night and IFR navigation capability. The crew compartment accommodates one pilot (right side seat) and one co-pilot or passenger (left side seat). The doors of the helicopter are separate, hinged & jettisonable on each side. The helicopter (VT-EVV) is approved for carrying maximum of 5 passengers and has separate sliding doors with jettisonable windows on each side. The helicopter's authorized Maximum All-Up Weight is 3175 Kg, including 460 Kg of fuel (Usable fuel- 450 Kg). The helicopter has hydraulically operated tricycle type retractable landing gear which is controlled from cockpit.

The rotor flight control system gives positive control of attitude, speed and altitude of the helicopter. The system includes main rotor control system, tail rotor control system and servo

control system. The main rotor control system controls the helicopter in pitch and roll, climb and descent. The main rotor control system includes, the collective control system, the cyclic control system, the magnetic-brake artificial-feel and trim units, the stabilization actuators and the mixing control system.

**2.2 Flight Data Recorder (FDR) Information.** VT-EVV helicopter is installed with L3 Collins FA2300 series P/N 2316-1600-00 FDR. The equipment is installed at the rear avionic bay of the helicopter. It is a combined Cockpit Voice and Flight Data Recorder (CVFDR) system. The CVFDR system records helicopter parameters and audio signals in a solid state, non-volatile memory. The memory module stores information of the flight parameters as well as Cockpit Voice recording. The CVR information of the previous 2 hours is stored, whereas, the flight data parameters of the previous 25 hours are stored. The information is stored in a Crash Survivable Memory Unit (CSMU). This unit is capable of withstanding temperatures up to 1100° C for about one hour or 800° C for about 3 hours. An impact switch is installed in the aft avionic bay. On operation of the impact switch, the FDR stops to record.

**2.3 DCU Information.** Each engine is equipped with a Data Collection Unit (DCU). The purpose of this electronic device is to serve as a repository for various engine trim parameters, accumulated operation times, accumulated part cycles and specific operational exceedance data. The EEC's automatically store the data in the DCU in snapshot format. A snapshot is taken when an event is triggered. An event could be a One Engine Inoperative (OEI) rating range, ultimate limit exceedance, a fault, an event such as a commanded auto to manual mode changeover or an unexpected flame out. A snapshot consists of a standard set of parameters with reference to engine runtime. In both engine's DCU data there are certain parameters such as torque, gas generator and power turbine speeds, which confirm the power level of the other engine.

#### 2.4 Technical Information of VT-EVV

Helicopter Model	Augusta Westland AW109S Grand
Helicopter SI No	22040
Year of Manufacturer	2007
Name of Owner	M/s Heritage Aviation Pvt Ltd
Certificate of Registration	Valid
Certificate of Airworthiness	Valid
Airworthiness Review Certificate	Issued On: 16 Apr 2024 Valid Upto: 31 Oct 2024
Date of Aircraft weighment	28 May 23
Empty Weight C. G	1.635 m ahead of front Jack point
Next Weighing due on	28 May 28
Max Take-off Weight	3175 Kg
Total aircraft Hours	3339:55 Hrs Since New
Last major inspection (on aircraft)	<ul style="list-style-type: none"> <li>• 3200 Hrs Scheduled Insp at 3114:45 Hrs on 19 Feb 24</li> <li>• 200 Hrs Airframe Inspection at 3330:10 Hrs on 16 Sep 24.</li> </ul>

Engine Type	Pratt and Whitney PW 207C
Engine SI No.	LH: BH0095 RH: BH 0093
Engine Time Between Overhaul (TBO)	4000 Hrs
Total Engine Hours Since New	LH: 3188:25 Hrs RH: 3309:45 Hrs
Last major inspection (on engine)	800 Hrs Scheduled Servicing done at: LH: 2993:25 Hrs RH: 3114:45 Hrs
Total Engine Hours Since Overhaul	Engines not due for Overhaul
Aero mobile License Validity	30 Oct 2024

M/s Heritage Aviation Pvt Ltd was operating the Helicopter on Lease till Jun 2024. In Jun 2024 the helicopter ownership was transferred and registered in the name of M/s Heritage Aviation Pvt Ltd.

### 3. Crew and AME information

#### 3.1. Pilot Flying

Nationality	Indian
Date of Joining Organization	15-10-2022
Age	64 yrs
License	ATPL (H)
Date of Issue of License	17-03-2017
License Valid up to	16-03-2027
Class 1 Medical Exam Done on	06-05-2024
Class 1 Medical Valid up to	09-11-2024
Date of issue of FRTOL	11-08-2005
FRTOL license valid up to	10-08-2025
Endorsement as PIC	AW109, BELL 407, A109, SA316/315
Total Flying experience	8400 Hrs
Total Flying experience on type (AW109S)	3820 Hrs
Last flown on type	01 Oct 2024
Total Flying experience during last 1 year	196 Hrs
Total Flyng experience during last 6 months	95 Hrs
Total flying experience during last 90 days	25:50 Hrs
Total flying experience during last 30 days	25:50 Hrs

#### 3.2 Pilot Monitoring

Nationality	Indian
Date of Joining Organization	29-12-2018
Age	53 yrs
License	CPL(H)
Date of Issue of License	24-07-2015

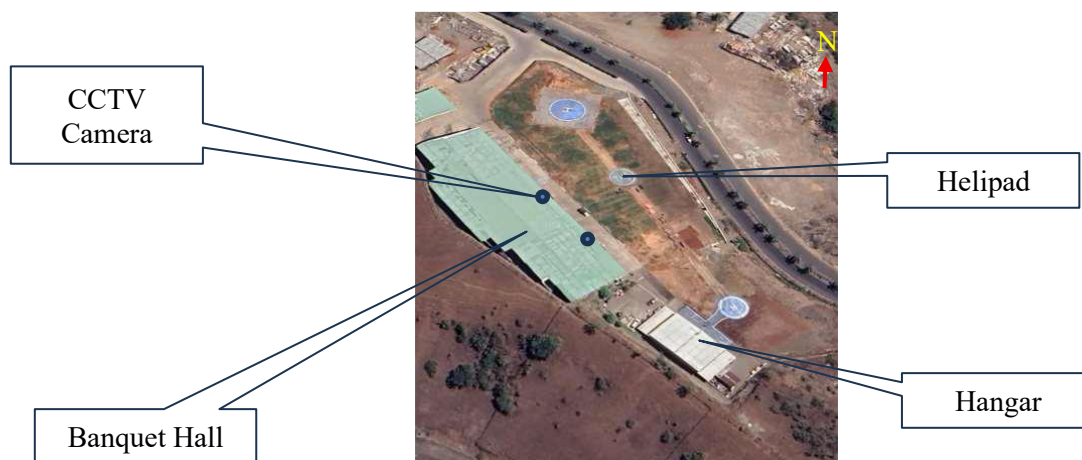
License Valid up to	23-07-2025
Class 1 Medical Exam done on	20-06-2024
Class 1 Medical Valid up to	10-01-2025
Date of issue of FRTOL	24-07-2015
FRTOL license valid up to	23-07-2025
Endorsement as PIC	SA316/315, A109
Total Flying experience	6500 Hrs
Total Flying experience on type (AW109S)	1550 Hrs
Last flown on type	01 Oct 2024
Total Flying experience during last 1 year	352 Hrs
Total Flying experience during last 6 months	188 Hrs
Total flying experience during last 90 days	69 Hrs
Total flying experience during last 30 days	35 Hrs

### 3.3 Aircraft Maintenance Engineer on Board

Nationality	Indian
Date of Joining Organization	26-02-2019
Age	56 yrs
License	AME
Date of Issue	31-12-2015
Valid up to	30-08-2026
Category	B1

## 4. Aerodrome Information

Oxford Golf Course Helipad is a private uncontrolled Helipad located near Bavdhan Pune. It is located at 124°/60 NM from BBB (Mumbai) VOR and 250°/10 NM from PPN (Pune) VOR. The Geographical coordinates of the Helipad are Latitude: N 18°31'19" and Longitude: E 73°44'53". The Helipad is located at an altitude of approximately 809 m (2654 ft) AMSL. There is no ATC/Met/Fire service at the Helipad. Adjacent to the Helipad are two structures. One is a hangar used by a NSOP Operator and the other is a structure used as Banquet/Function hall. These two structures are approximately at a distance of 50-60 m from the helipad. Wind sock is available on the top of the hangar, but was in a torn condition on the day of accident. There are two CCTV cameras installed at the Banquet hall which are facing towards the helipad.



**Fig 1: Oxford Golf Course Helipad**

**4.1 Topography.** Bavdhan is a hilly area near Pune, with numerous natural elevations and undulations. To the east of the helipad, a natural bowl is formed due to the nearby hills. The slope of the bowl starts at approximately 100-150 m to the east of the helipad.

## 5. Weather Information

**5.1 Meteorological Information.** There is no meteorological facility available at Oxford Helipad. As a practice, the operator has given the weather information of Pune, Mumbai and Juhu Airfield to the crew on their Mobile phone. The following details were shared:-

Station	Date/Time (UTC)	Wind	Visibility	RVR	Weather	Clouds	Temp/Dewpoint °C	QNH (hPa)	Trend
VAPO	02.10.2024/0100	VRB02KT	2500	—	BR	SCT250	24/23	1013	TEMPO 2000 BR
VABB	02.10.2024/0130	02003KT	1200	R27/1800	BR	FEW020 SCT100	29/26	1008	NOSIG
VAJJ	02.10.2024/1230	32007KT	3000	—	HZ	FEW020 SCT100	30/27	1005	NOSIG

The weather information subsequently obtained from Met department by AAIB for Pune Airfield (VAPO) for 02 Oct 24 from 0100 UTC to 0300 UTC is as follows: -

Date/Time (UTC)	Wind	Visibility (Meters)	Weather	Clouds	Temp/Dewpoint °C	QNH (hPa)	Trend
02.10.2024/0100	VRB02KT	2500	BR	SCT250	24/23	1013	TEMPO 2000 BR
02.10.2024/0130	VRB02KT	2500	BR	SCT250	24/23	1013	TEMPO 2000 BR
02.10.2024/0200	VRB02KT	3000	BR	SCT250	24/23	1013	TEMPO 2000 BR
02.10.2024/0230	29004KT	3000	BR	FEW025 SCT200	26/25	1013	BECMG 4000 BR
02.10.2024/0300	27003KT	3000	BR	FEW025 SCT250	27/25	1013	BECMG 4000 BR

**5.2 CCTV Footage.** CCTV footage obtained from the helipad was viewed. It was observed that the visibility at the Helipad was poor due to fog at the time of helicopter take-off. The conditions remained same till about 0400 UTC as per information given by witness.



**Fig 2: Weather conditions at Oxford Helipad on Morning of 02 Oct 24**

*(Date seen in the CCTV footage is in MM-DD-YYYY format)*



The helipad is located approximately at an aerial distance of 10 Nautical miles from Pune Airfield in South West direction. Due to the topography and underlying terrain of the Helipad location, the weather conditions differ from those predicted for the Pune Airfield, as is evident from the CCTV footage and weather prediction.

## 6. Wreckage and Impact information

The helicopter crashed at an aerial distance of approximately 400-420 m from Oxford Golf Course helipad. The main rotor blade touched the ground first due to the roll and pitch down attitude of the helicopter. The helicopter tumbled and due to the impact forces, the helicopter structure got disintegrated and tail portion got separated from the main body. All the three occupants sitting in the helicopter were thrown out of the helicopter along with seats. The wreckage was confined to a small area, and no damage was reported to any nearby property.

The helicopter caught fire and was destroyed in the accident. Many of the parts made of light alloy, composite material got burnt and destroyed. The Electronic Display Unit (EDU), Data Acquisition Unit (DAU), Data Collection Units (One on each engine) and FDR (only CSMU) were retrieved from the wreckage in damaged condition. The major components were heavily damaged due to fire and impact forces. The main and tail rotor blades were damaged on impact with ground. Both the aeroengines were found in the wreckage. The free turbine blades are damaged and the casing is found dented. The turbine blades of Gas Generator are available on the rotor and could be rotated with hand. Many of the gauges and display on the instrument cluster were broken/damaged. Some of the electrical looms are burnt. Due to the impact forces, the spring mechanism inside the switches is also damaged. No fuel or oil sample from the helicopter could be collected as the helicopter had caught fire and all the fuel and oil were burnt.

The coordinates of the accident site are 18° 31'33.94" N, 073° 44'58.09" E. As per FDR data, the helicopter was on a heading of 033° at the time of impact.

On impact, the ELT was activated and at about 0158 UTC, the Accountable Manager of Heritage Aviation Pvt Ltd received message about ELT activation.





**Fig 3: Pictures of VT-EVV Wreckage**



**Fig 4: Location of Accident Site and Helipad**

## 7. Brief description of accident flight

On 01 Oct 2024 (day previous to accident), Augusta Westland AW109S Grand helicopter bearing registration VT-EVV operated by M/s Heritage Aviation Pvt Ltd started from Juhu at about 0930 UTC and flew to Parli to drop a passenger. The flying time from Juhu to Parli is about 1:30 Hrs. The helicopter had 04 occupants (02-Air Crew, 01 AME and 01 Passenger). After dropping the passenger at Parli, the helicopter took off for Pune at 1125 UTC and landed at Oxford Helipad at about 1245 UTC. The helicopter landed at the Oxford Golf Course Helipad with 250 liters of fuel remaining in tanks. The helicopter was parked on a heading of 248° i.e. facing towards the Banquet Hall area. CCTV footage shows, that the AME had carried out post flight maintenance checks on the Helicopter and secured the rotors before leaving for hotel. The operator arranged for landing and overnight parking of the Helicopter at Oxford Golf Course Helipad. The Air crew was operating at Oxford Golf Course Helipad for the first time. They were briefed by another pilot of the Company who had



previously operated at the same helipad.

As per the initial plan, the take-off from Juhu was planned at 0800 UTC and the helicopter was to return back to Juhu on same day for a commitment on next day. However, due to late arrival of the passenger, the helicopter took off for Parli at 0930 UTC. Due to delayed take-off, sufficient time to return back to Juhu on the same day was not available. Therefore, it was planned to make a night halt at Pune as sufficient facilities are not available at Parli. To cater for helicopter inspection post landing at Pune and prior to first flight next day, AME was also sent in the helicopter. Keeping in view the local flying restrictions, the take-off on next day was planned at 0200 UTC

Next day i.e. on 02 Oct 2024, as seen on CCTV footage, AME arrived at Helipad at about 0103 UTC and carried out pre-flight checks on the helicopter. The Air Crew arrived at the Helipad at about 0135 UTC. BA test was carried out for Air Crew. As per the available records, the BA report of the Crew is satisfactory. Thereafter, at about 0154 UTC the helicopter took off from Oxford Golf Course Helipad Pune for Juhu airfield. Onboard the helicopter were two Air Crew and one AME. After take-off, the helicopter was visible on CCTV for a very short time before it was obscured due to fog. As per the FDR data, the accident happened soon after take-off. The Helicopter is destroyed in the accident. All the three occupants on board the Helicopter sustained fatal injuries.

## 8. Progress of Investigation

The accredited representatives from State of Manufacture of Aircraft i.e. ANSV, Italy (Italian Aircraft Accident Investigation Agency) and State of Manufacture of Engine i.e. TSB, Canada are associated with the investigation. A Type rated pilot on AW109S as SME is also included in the investigation team.

**8.1 Preliminary FDR Analysis.** The Chassis of the FDR along with the circuit boards was heavily damaged due to fire. Only the CSMU of the FDR was found in burnt/damaged condition at the accident site. The cables, connectors and chassis of the FDR equipment had burnt in the fire. The data from the burnt CSMU of the FDR equipment was downloaded at ANSV facility at Italy.



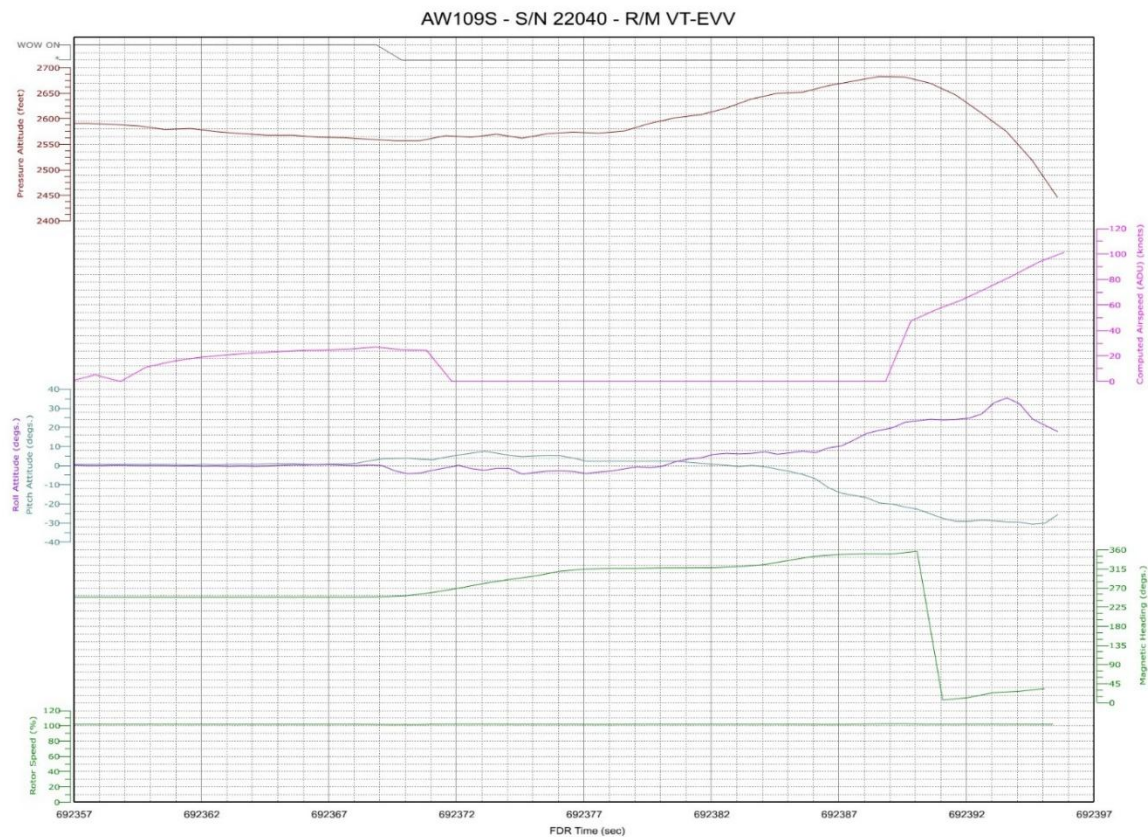
**Fig 5: CSMU of the FDR: VT-EVV**

To corroborate the FDR information, the available visual clues from CCTV footage like commencement of rotation of the helicopter main rotor, closing of the passenger door, heading of the helicopter, landing gear position, lifting-off of helicopter from ground and heading change due



to RH rotation of the helicopter after lift-off were compared with the timelines on FDR and found correct.

The FDR data reveal that the helicopter flew for about 26 sec after take-off from the helipad. Immediately after lift-off, the helicopter made a (on the spot) right hand turn changing the heading from 248° to 315° in about 8 sec. Thereafter, it started gaining height. The helicopter gained a maximum height of approximately 93 feet from the point of take-off in about 11 sec, before it started descending/losing altitude. At the time of impact the aircraft was approximately in 30° pitch down attitude with 35° roll to the right and on a heading of 033°. The place of impact is approximately at a height 2450 feet AMSL. The total time from engine start to the impact is 220 sec. Preliminary analysis of the FDR does not show any abnormality in Hydraulic pressures, Engine EGT, oil pressures and electrical voltages. The spectrum analysis of the engines is being attempted with the available CVR data. The Fuel quantity recorded in FDR previous day after landing at Oxford Golf Course Helipad and the one recorded in Tech Log is matching. The pressure altitude recorded on the FDR is similar to the AMSL altitude of Oxford Helipad and the crash site. Further analysis of the controls input and other parameters is under progress.



**Fig 6: FDR Parameters**

**8.2 DCU Analysis.** The DCUs retrieved from accident site were also burnt and damaged. The Data Collection Unit (DCU) of the two engines were sent to TSB Canada for downloading and analysis of the aeroengine related data. On opening the DCU it was found that the circuitry was significantly burnt and most of the components had separated from the boards. Also, some of the chips have been destroyed. The data could be obtained only from the DCU of Engine No BH0095. Data from DCU of Engine No BH0093 could not be retrieved as it was damaged. The

analysis of the decoded data indicate that the engines were running at power and coupled to the main rotor.



**Fig 7: DCU of Engine 1 and 2**

8.3 **Documents** Documents and Records related to Helicopter and Crew obtained from the Operator were analyzed. The flight report book/ Technical Log for the previous one year is checked. No defect is recorded by the Pilot or AME in the previous one year. The Log book of the helicopter, Work records of periodic maintenance carried out on the helicopter, DGCA Audits, operator procedures and other records are being scrutinized by the team.