AIRCRAFT ACCIDENT FINAL REPORT

A 01/21

Air Accidents Investigation Bureau (AAIB)

Ministry of Transport

Accident Involving a Robinson R66

Registration 9M-SAW

at Pulau Indah, Port Klang

on the 1 January 2021

Air Accidents Investigation Bureau
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Issued on 1 January 2022
MOT(S).600-5/4/79

AIR ACCIDENTS INVESTIGATION BUREAU (AAIB)
MALAYSIA

ACCIDENT REPORT NO. : A 01/21

OWNER / OPERATOR	**:**	**VUELO AG SDN BHD**
AIRCRAFT TYPE	**:**	**ROBINSON R66**
NATIONALITY	**:**	**MALAYSIA**
REGISTRATION	**:**	**9M-SAW**
PLACE OF OCCURRENCE	**:**	**PULAU INDAH, PORT KLANG**
DATE AND TIME	**:**	**1 JANUARY 2021 AT 1000LT**

This investigation is carried out to determine the circumstances and causes of the accident with the sole objective for the preservation of life and the avoidance of accidents in the future. It is not for the purpose of apportioning blame or liability (Annex 13 to the Chicago Convention).

All times in this report are Local Time (LT) unless stated otherwise. LT is UTC +8 hours.

INTRODUCTION

The Air Accidents Investigation Bureau Malaysia

The Air Accidents Investigation Bureau (AAIB) is the air accident and serious incident investigation authority in Malaysia and is accountable to the Minister of Transport. Its mission is to promote aviation safety through the conduct of independent and objective investigations into air accidents and serious incidents.

The AAIB conducts the investigations in accordance with Annex 13 to the Chicago Convention, the Civil Aviation Act of Malaysia 1969 and the Civil Aviation Regulations of Malaysia 2016.

It is inappropriate that AAIB reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting processes has been undertaken for that purpose.

In accordance with ICAO Annex 13 paragraph 4.1, notification of the accident was sent out on 6 January 2021 to the National Transportation Safety Board (NTSB), United States of America as the State of Design and Manufacturer.

Unless otherwise indicated, recommendations in this report are addressed to the investigating or regulatory authorities of the State having responsibility for the matters with which the recommendations are concerned. It is for those authorities to decide what action is to be taken.

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ABBREVIATIONS

AAIB	Air Accidents Investigation Bureau
AMO	Approved Maintenance Organisation
CAAM	Civil Aviation Authority of Malaysia
LT	Local Time
PIC	Pilot-in-Command
POB	Persons on Board
QHI	Qualified Helicopter Instructor
RT	Radio Telephony
WMSA	ICAO Code for Sultan Abdul Aziz Shah Airport

DEFINITIONS

CYCLIC

The cyclic control, commonly called the cyclic stick or just cyclic, is similar in appearance on most helicopters to a control stick from a conventional aircraft. During forward flight, the cyclic control inputs cause flight path changes similar to fixed-wing aircraft flight.

DYNAMIC ROLLOVER

A helicopter is susceptible to a rolling tendency, called dynamic rollover, when close to the ground, especially when taking off or landing. For dynamic rollover to occur, some factor has to first cause the helicopter to roll or pivot around a skid, or landing gear wheel, until its critical rollover angle is reached. Then, beyond this point, main rotor thrust continues the roll and recovery is impossible. If the critical rollover angle is exceeded, the helicopter rolls on its side regardless of the cyclic control corrections made.

SYNOPSIS

On 1 January 2021, a Robinson R66 light helicopter from a local flying club bearing the registration 9M-SAW was involved in an accident on Pulau Indah, Port Klang. The aircraft had 2 POB.

9M-SAW toppled over during an attempted landing in an empty clearing which had been levelled and resurfaced with compacted gravel. This caused both of its occupants to be injured.

The AAIB Chief Inspector was notified within the hour and an investigation team was dispatched immediately.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On Friday, 1 January 2021, at approximately 0800, the ill-fated helicopter took-off from Sultan Abdul Aziz Shah Airport, Subang (WMSA). The intended route as per the Flight Plan **(APPENDIX B)** was WMSA – Port Klang – Pulau Indah – WMSA.

The purpose of the flight was for a demonstration to be carried out for the benefit of the right-hand seat pilot who was interested in buying a helicopter of a similar type. During their flight, the characteristics and controls of the aircraft was showcased by the left-hand seat pilot who as the Pilot-in-Command (PIC) was also a Qualified Helicopter Instructor (QHI).

Upon reaching Pulau Indah, the PIC decided to execute some approaches to land at an vacant lot which had a surface consisting of levelled compacted gravel. The first approach to land was uneventful. This was followed by some hover manoeuvres before a second approach was attempted.

This second approach terminated in a high hover initially at approximately 10-15 ft before a lower hover was achieved at 3-5 ft. It

was during the subsequent attempted landing that the PIC admitted that he overcontrolled a bit on the cyclic to the left and aft. There was a loud bang from the rear of the aircraft followed by it bouncing to the left before toppling over.

The aircraft finally came to a rest on its left side. The right-hand seat pilot who was only lightly injured managed to shut-off the engine before egressing via his starboard door. He then assisted the PIC who was much more seriously injured to vacate the aircraft via the same starboard door with the help of some villagers who had by now arrived at the scene.

The right-hand seat pilot then proceeded to call for emergency services from the nearby port authority. Within minutes Police and Fire & Rescue services were on scene followed by an ambulance. Both pilots were then taken to Hospital Tengku Ampuan Rahimah in Klang for further medical assistance.

On-site investigations were then carried out by both the Police and AAIB. By afternoon, the on-site investigations were completed and the wreckage was then cleared and transported back to the facilities of the responsible AMO service provider.

1.2 Injuries to Persons

Both the occupants of 9M-SAW were injured, one seriously. No one on ground was affected.

	9M-SAW	
Injuries	**Crew**	**Pax**
Fatal	-	-
Serious	1	-
Minor / None	1	-

1.3 Damage to Aircraft

For images of damage to the aircraft on-site please refer to **APPENDIX C**.

The Damage Assessment Reports can be gleaned from **APPENDICES D & E**.

1.4 Other Damages

The area onto which 9M-SAW crashed was a vacant lot which had a surface consisting of levelled compacted gravel. Apart from impact and scuff marks on the ground, no damage to other property was noticed. There was no post-impact fire.

1.5 Personnel Information

Both occupants of the helicopter were members of the same local flying club. The PIC of 9M-SAW was an instructor and the right-hand seat pilot an ordinary member.

1.6 Meteorological Information

The weather on that fateful day was clear with light and variable winds.

1.7 Aids to Navigation

Not applicable.

1.8 Communications

No distress calls were made that day over the RT. Information about the accident was only relayed by the right-hand seat pilot using his handphone after he had egressed from the aircraft.

1.9 Aerodrome Information

Not applicable.

1.10 Flight Recorders

The Robinson R66 light helicopter is not equipped with flight recorders nor is it mandated by law to do so.

1.11 Wreckage and Impact Information

A visual assessment at the crash site revealed that 9M-SAW had somehow contacted the ground and this had set of a sequence of events that included the tail boom of the aircraft being severed by the rotor blades causing it to be displaced by about 30m from the main wreckage **(APPENDIX C)**. There were also numerous shallow impact and scuff marks in the gravel.

1.12 Medical and Pathological Information

Both pilots of 9M-SAW were sent for a medical check-up by an ambulance immediately after the accident. Although the right-hand seat pilot only sustained light injuries (cuts and bruises), the PIC however had much more serious injuries due to his seating position on the left. The

PIC suffered a broken left collar bone, fractured his ribs (No 1 through 7) on his left side and experienced high blood pressure.

1.13 Fire

There was no post-impact fire.

1.14 Survival Aspects

As the helicopter had come to a rest on its left side, both pilots managed to egress through the right-hand cockpit door albeit with some difficulty due to the position of the aircraft and in the case of the PIC due to his injuries. It must also be noted that although there was some fuel leakage, no post-impact fire occurred.

1.15 Tests and Research

No forensic tests are pending.

1.16 Organisational and Management Information

The operator of the helicopter, My Heli Club, is a non-commercial establishment under the Registrar of Societies. It was formed on 3 August 2018.

Its members consist of helicopter pilots, owners, retired aviation industry professionals and flying enthusiasts. The club not only facilitates its members' enthusiasm for helicopters but also offers a platform for them to become certified helicopter pilots at an affordable price.

The club had obtained approval from CAAM on 19 August 2019 to offer the Helicopters' Private Pilots Licence [PPL(H)] helicopter flight training programme to its members.

1.17 Additional Information

An Accident Notification Form was transmitted by AAIB Malaysia to ICAO on the day of the accident itself. A copy of the form can be found at **APPENDIX A**.

1.18 Useful or Effective Investigation Techniques

Nil.

2.0 ANALYSIS

2.1 During the demonstration flight, the left-hand seat pilot (PIC) who was a QHI had full control throughout. On occasion he would allow the right-hand seat pilot to follow him through on the controls whilst demonstrating certain manoeuvres showcasing the characteristics and controls of the aircraft.

2.2 During the ill-fated attempt to land the aircraft a second time, the PIC admitted that he overcontrolled on the cyclic a bit to the left and aft before he heard a loud bang from the rear followed by the aircraft bouncing to the left and toppling over.

2.3 One of the most plausible explanations for this scenario would be an incidence of Dynamic Rollover. This would require the aircraft to pivot about its skid during the landing attempt prior to it toppling over. The pivoting of the aircraft most probably occurred when the cyclic was overcontrolled.

3.0 CONCLUSION

This incident is an unfortunate occurrence of Dynamic Rollover.

4.0 SAFETY RECOMMENDATIONS

CAAM is to ensure all helicopter operators are reminded of the dangers of Dynamic Rollover in their everyday operations especially so when landing on substandard surfaces.

INVESTIGATOR-IN-CHARGE
Air Accidents Investigation Bureau
Ministry of Transport
1 January 2022