

AIRCRAFT ACCIDENT

FINAL REPORT

A 06/24

Air Accident Investigation Bureau (AAIB)

Ministry of Transport, Malaysia

Accident Involving Fixed Wing Aircraft Cessna 172N,

Registration 9M-ADA, at Felda Gunung Besout, Slim River, Perak

on 4 May 2024



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AIR ACCIDENT INVESTIGATION BUREAU (AAIB) MALAYSIA

DRAFT FINAL REPORT NO : A 06/24

OWNER	: LAYANG LAYANG FLYING ACADEMY SDN. BHD.
OPERATOR	: LAYANG LAYANG FLYING ACADEMY, IPOH.
AIRCRAFT TYPE	: CESSNA 172N
NATIONALITY	: MALAYSIA
REGISTRATION	: 9M-ADA
PLACE OF OCCURRENCE	: FELDA GUNUNG BESOUT, SLIM RIVER, PERAK
DATE AND TIME	: 4 MAY 2024 AT 0935 LT (0135 UTC)

The sole objective of the investigation is the prevention of accidents and incidents. In accordance with Annex 13 to the Convention on International Civil Aviation, it is not the purpose of this investigation to apportion blame or liability.

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

INTRODUCTION

The Air Accident Investigation Bureau (AAIB) is the authority responsible for investigating air accidents and serious incidents in Malaysia, operating under the Ministry of Transport. The AAIB's mission is to promote aviation safety through independent and objective investigations into air accidents and serious incidents. Additionally, the AAIB investigates incidents that reveal potential safety issues.

All investigations by the AAIB are conducted in accordance with Annex 13 to the Convention on International Civil Aviation (ICAO Annex 13) and the Civil Aviation Regulations 2016. It is important to note that AAIB reports are not intended to apportion blame or determine liability, as neither the investigations nor the reporting processes are designed for those purposes. The sole objective of this investigation and the Final Report is the prevention of accidents and incidents.

In accordance with ICAO Annex 13, notification of the accident was sent to The National Transport Safety Board (NTSB), United States of America, as the State of Design and Manufacture, on 8 May 2024. The Preliminary Report was submitted on 6 June 2024 to the NTSB, the Civil Aviation Authority of Malaysia (CAAM), and the aircraft's owner and operator (Layang Layang Flying Academy). The Draft Final Report was subsequently sent on 6 March 2025 to the aforementioned organisations, inviting their significant and substantiated comments.

Unless otherwise indicated, recommendations in this report are addressed to the investigating or regulatory authorities of the State having responsibility for the matters concerning the recommendations. It is to those authorities to decide what actions to take.

ii

TABLE OF CONTENTS

CHAPTER		TITLE	PAGE NO
		INTRODUCTION	ii
		TABLE OF CONTENTS	iii
		LIST OF APPENDICES	iv
		GLOSSARY OF ABBREVIATIONS	V
		SYNOPSIS	1
1.0		FACTUAL INFORMATION	2
	1.1	History of the Flight	2
	1.2	Injuries to Persons	6
	1.3	Damage to Aircraft	7
	1.4	Other Damage	7
	1.5	Personnel Information	7
	1.6	Aircraft Information	8
	1.7	Meteorological Information	10
	1.8	Aids to Navigation	11
	1.9	Communications	11
	1.10	Aerodrome Information	11
	1.11	Flight Recorders	13
	1.12	Wreckage and Impact Information	13
	1.13	Medical and Pathological Information	15
	1.14	Fire	15
	1.15	Survival Aspects	15
	1.16	Tests and Research	15
	1.17	Organisational and Management Information	16
	1.18	Additional Information	16
	1.19	Useful or Effective Investigation Techniques	16
20			17
2.0			17
3.0		CONCLUSION	39
	3.1	Findings	39
	3.2	Cause and Contributing Factors	41
4.0			41
5.0		COMMENTS TO DRAFT FINAL REPORT	42
		CONCLUDING STATEMENT	43

LIST OF APPENDICES

А	Initial Damage Assessment Report	A-1 to A-17
В	Certificate of Registration (C of R) and Certificate of Airworthiness (C of A).	B-1
С	Meteorological Aerodrome Report (METAR) – Weather Report	C-1 to C-2
D	Weather Satellite and Radar Image Analysis, and Surface Weather Observation Report	D-1 to D-8
Е	LLFA Internal Memo – Guidelines for Safety Pilot	E-1 to E-4
F	CAAM Confirmation: No Official Application for Assigning an Instructor as a Safety Pilot During Student Solo Flights	F-1

GLOSSARY OF ABBREVIATIONS

Α	
AAIB	Air Accident Investigation Bureau
AFI	Assistant Flight Instructor
AGL	above ground level
ATC	Air Traffic Controller
•	
C	
CAAM	Civil Aviation Authority of Malaysia
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CPL	Commercial Pilot License
CVR	Cockpit Voice Recorder
F	
FDR	Flight Data Recorder
ft	feet
G	
GPS	Global Positioning System
H	
hrs	hours
1	
ΙΑΤΑ	International Air Transport Association
	International Civil Aviation Organization
	Instrument Meteorological Conditions
IPH	Sultan Azlan Shah Airport (IATA code)

К	
KLATCC	Kuala Lumpur Air Traffic Control Centre
km	kilometre
L	
LLFA	Layang Layang Flying Academy
LT	local time
М	
m	metre
METAR	Meteorological Aerodrome Report
MOR	Mandatory Occurrence Reporting
N	
nm	nautical mile
т	
TAF	Terminal Aerodrome Forecast
ТР	Trainee Pilot
v	
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
w	
WMKI	Sultan Azlan Shah Airport (ICAO code)
WMKK	Kuala Lumpur International Airport (ICAO code)

SYNOPSIS

On 4 May 2024, a Trainee Pilot (TP) from Layang Layang Flying Academy (LLFA), Ipoh, conducted an authorised navigation training flight. The pre-flight checks, startup, and taxi procedures were uneventful. The aircraft, a Cessna 172N registered as 9M-ADA and bearing the callsign LYG 1531, departed Sultan Azlan Shah Airport in Ipoh (ICAO code: WMKI; IATA code: IPH) at 0754 LT. The flight followed the planned training sortie profile, designated as Navigation Route 3A.

The flight proceeded as usual, with the last communication to the Kuala Lumpur Air Traffic Control Centre (KLATCC) at 0935 LT, updating the aircraft's position. However, by 0938 LT, flight LYG 1531 had ceased all radio transmissions. Attempts by Ipoh Air Traffic Control (IATC) to re-establish communication were unsuccessful.

At 0955 LT, the LLFA Operations Room in Ipoh received a phone call reporting that the aircraft had crashed in a forested area near Slim River, Perak.

A Mandatory Occurrence Report (MOR) was subsequently submitted by LLFA, the aircraft operator, to the Civil Aviation Authority of Malaysia (CAAM) and the Air Accident Investigation Bureau (AAIB) Malaysia as the official notification of the accident.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On 4 May 2024, a Trainee Pilot (TP) from Layang Layang Flying Academy (LLFA) in Ipoh, Perak, conducted an authorised Navigation Exercise (NAVEX) in a Cessna 172N aircraft (registration 9M-ADA, callsign LYG 1531). The TP was accompanied by an Assistant Flight Instructor (AFI). In this flight, the AFI acted as the Safety Pilot.

The training route followed LLFA's NAVEX Route 3A, which begins at WMKI and passes over the waypoints of Ayer Tawar, Pulau Pangkor, Teluk Intan, Sabak Bernam, Tanjung Karang, Ulu Bernam, Sungkai, Bidor, Kampar, and Gopeng before returning to WMKI, as illustrated in Figures 1A and 1B.

All pre-flight procedures, including start-up, taxi, departure, and the initial navigation phase, were completed without abnormalities. The aircraft, LYG 1531, departed from WMKI at 0759 LT as scheduled. The initial segment of the route—WMKI, Ayer Tawar, Pulau Pangkor, Teluk Intan, and Sabak Bernam—was uneventful.

LYG 1531 initially cruised at an altitude of 4,000 ft. However, at approximately 0900 LT, while passing over Sabak Bernam, the TP observed adverse weather conditions ahead, including dark, cloudy skies, which prevented the flight from continuing to its final southern waypoint, Tanjung Karang.

In the Sekinchan area, the TP deviated from the planned route, heading north toward the waypoints Ulu Bernam and Sungkai to return to WMKI, as illustrated in Figure 2.

While approaching Ulu Bernam, the TP encountered cloud cover at an altitude of 4,000 ft, prompting LYG 1531 to gradually descend to 2,500 ft. At 0924 LT, after passing the Ulu Bernam waypoint, LYG 1531 again encountered worsening weather conditions, with cloud cover at 2,500 ft. The TP then requested clearance to descend to 1,000 ft to maintain visual contact with the terrain, which KLATCC approved.

While descending to 1,000 feet, the Safety Pilot took control of the aircraft and attempted to level off at that altitude. However, the aircraft inadvertently entered cloudy weather and became trapped in Instrument Meteorological Conditions (IMC). Caught in this situation, the Safety Pilot tried to navigate around the weather and regain visual contact with the terrain but was unsuccessful. As a result, the aircraft unintentionally struck trees, became uncontrollable, and ultimately crashed.

The aircraft was expected to report its position to KLATCC as it approached Bidor at approximately 0938 LT. However, no radio transmission was received from LYG 1531. IATC also attempted to re-establish communication but was unsuccessful.

At 0955 LT, the LLFA Operations Room in Ipoh received a telephone call from members of the public reporting that LYG 1531 had crashed near Slim River, Perak. The actual time of the crash was 0935 LT.

Both aircrew members survived the accident but suffered serious injuries. The aircraft sustained major damage upon impact with the ground.



Figure 1A: A flight map for the NAVEX Route 3A¹

¹ Source: Manual Navigation Map, courtesy of LLFA.



Figure 1B: A flight map for the NAVEX Route 3A²

² Source: LLFA's Training and Procedures Manual, Part 8 - Appendices, Annex E10.



Figure 2: Planned route vs. flown route, and crash location³

1.2 Injuries to Persons

Injuries	Crew	Passengers	Others	Total
Fatal	NIL	NIL	NIL	NIL
Serious	2	NIL	NIL	2
Minor	NIL	NIL	NIL	NIL
None	NIL	NIL	NIL	NIL

Table 1: Injuries to persons

³ Source: Data from the Garmin Aera 660 overlaid onto Google Earth map.

1.3 Damage to Aircraft

The aircraft sustained major damage due to striking trees and the hard impact with the ground. Overall, the damage is classified as Beyond Economical Repair (BER). The Initial Damage Assessment is provided in Appendix A.

1.4 Other Damage

Approximately 10 to 15 trees were found uprooted, while another 10 trees had broken branches and trunks after being struck by the aircraft before it crashed. The crash site is located in a reserve forest, which falls under the jurisdiction of the Forestry Department of Malaysia.

1.5 Personnel Information

1.5.1 Pilot

Status		Trainee Pilot (TP)
Nationality		Malaysian
Age		19 years old
Gender		Female
License Type (CAAM)		Student Pilot Licence- (Aeroplane)
License Issuance / Expiry Dates		Issued: 29 December 2022 Expiry: 31 December 2024
Medical Certificate (CAAM)		Issued: 6 December 2023 Expiry: 31 December 2024
Aircraft Rating		Nil
Instructor Rating		N/A
Rest period since last flight		120.00 hrs
	Total Hours	84.30 hrs
riying nours	Total on Type	84.30 hrs

Table 2: Personnel information – Pilot (TP)

1.5.2 Safety Pilot⁴

Status		Assistant Flight Instructor (AFI)
Nationality		Malaysian
Age		26
Gender		Male
License Type (CAAM)		Commercial Pilot Licence (CPL)-(Aeroplane) and Instrument Rating (IR)
License Issuance / Expiry Dates		Issued: 2 May 2023 Expiry: 31 May 2024
Medical Certificate (CAAM)		Issued: 6 December 2023 Expiry: 31 May 2024
Aircraft Rating		P1 Cessna 172
Instructor Rating		P1 Cessna 172
Rest period since last flight		38.00 hrs
	Total Hours	361.05 hrs
	Total on Type	287.10 hrs

Table 3: Personnel information – Safety Pilot

The TP was licensed, qualified, and approved to perform the flight in accordance with existing regulations. The TP was also confirmed to be medically fit and adequately rested to operate the flight. The Safety Pilot was CPL and IR licensed, qualified, and authorised to serve as a flight instructor.

1.6 Aircraft Information

1.6.1 General

The Cessna 172N is a four-seat, single-engine, high-wing, fixed-wing aircraft powered by a 180-horsepower (119 kW) Lycoming O-320-D2G engine. It is manufactured by

⁴ A Safety Pilot is a qualified pilot who assists in the cockpit to enhance flight safety, particularly in training or practice sessions where one pilot is flying under simulated instrument conditions.

Textron Aviation Inc., based in the United States of America. Figure 3 illustrates the basic dimensions of the Cessna 172N model for reference.



Figure 3: Basic dimensions of the Cessna 172N⁵

1.6.2 Aircraft Data

The details of aircraft data as shown in the table 4 below:

Aircraft Type	Cessna 172N
Manufacturer	Textron Aviation Inc., USA
Year of Manufacturer	1983
Owner	Layang Layang Flying Academy (LLFA), Sdn. Bhd.
Operator	Layang Layang Flying Academy (LLFA), Ipoh, Perak
Registration Number	9M-ADA
Aircraft Serial Number	17268288
Certificate of Airworthiness (C of A)	Issued: 11 March 2024

⁵ Source: Cessna 172N Aircraft Manual and courtesy of LLFA, and https://www.researchgate.net/figure/Simulated-Aircraft-Cessna-172_fig2_348974829.

	Expiry: 10 March 2025
Certificate of Registration (C of R)	Issued: 8 May 2023 Expiry: 7 May 2026
Airframe hours	15,481.00 hrs
Engine hours	1,903.00 hrs

Table 4: Aircraft data

The aircraft flown that day was in airworthy and serviceable condition, with a valid Certificate of Registration (C of R) and Certificate of Airworthiness (C of A). Copies of both the C of R and C of A are provided in Appendix B. The aircraft had been maintained in compliance with current regulations, and maintenance records indicated that it was managed and serviced according to approved procedures and existing regulations.

1.7 Meteorological Information

The accident occurred during the daytime at Felda Gunung Besout, near Slim River, Perak. The initial weather conditions, based on the Meteorological Aerodrome Report (METAR) for WMKI at 0700 LT on 4 May 2024, before and shortly after the flight took off, are shown in Table 5 below. A detailed weather report is provided in Appendix C.

Visibility	8 km.
Wind	Variable direction at 2 knots.
Cloud	Few clouds at 500 ft AGL and scattered clouds at 2,600 ft AGL.

Table 5: METAR for WMKI

The TP encountered favourable weather conditions while passing over several waypoints during the initial segment of the training route, including Ayer Tawar, Pulau Pangkor, Teluk Intan, and Sabak Bernam. However, according to statements from both aircrew members, the first instance of adverse weather—characterised by cloudy and dark skies—occurred as the aircraft passed Sabak Bernam, heading toward its final southern waypoint at Tanjung Karang. A second bout of adverse weather was

encountered as the flight approached Ulu Bernam, where clouds were reported at an altitude of 4,000 ft. These conditions persisted as the flight descended to 2,500 ft, eventually forcing the aircraft to descend further to 1,000 ft in the Slim River area, with the TP attempting to regain visual contact with the terrain.

Weather satellite imagery (Satellite Himawari-9) indicates the presence of medium clouds and high clouds between 0920 and 0940 LT within a 10 nm radius of Sungkai, covering the crash area, with 'no convective clouds'⁶. On the other hand, radar images from the Kuala Gula Radar Station show 'no precipitation echoes'⁷ at the same time and location. However, the Surface Weather Observation Report by MET Malaysia confirmed that there were humid conditions, low clouds, and fog between 0900 LT and 1000 LT within a 10 nm radius of the Sungkai area. A detailed weather analysis and a report are provided in Appendix D.

1.8 Aids to Navigation

All navigation aids at WMKI and WMKK were operating normally. The TP also used a portable Garmin Aera 660 GPS device as a supplementary navigation tool, which functioned properly throughout the flight.

1.9 Communications

All ATC communication frequencies were functioning normally.

1.10 Aerodrome Information

The accident location is neither within nor part of the aerodrome. LLFA is based at Sultan Azlan Shah Airport (WMKI), and its aircraft operate from there.

⁶ "No convective clouds" indicates that the atmosphere is stable, with no significant vertical air movement, meaning there is little to no risk of thunderstorms or severe weather.

⁷ "No precipitation echoes" means that a weather radar did not detect any precipitation (rain, snow, hail, or drizzle) in the scanned area at the given time.

Airfield	Sultan Azlan Shah Airport, Ipoh.
Runway	04 / 22
Length	1,798 m (5,898 ft)
Width	22 m (72 ft)
ICAO designator/ code	WMKI
IATA designator/ code	IPH
Elevation	40 m (131 ft)

Table 6: Sultan Azlan Shah Airport (WMKI) Aerodrome information



Figure 4: Sultan Azlan Shah Airport (WMKI) layout diagram⁸

⁸ Source: LLFA's Training and Procedures Manual - General, Part 1, Chap. 10, page 66.

1.11 Flight Recorders

The aircraft was not equipped with a Flight Data Recorder (FDR) or a Cockpit Voice Recorder (CVR), as these systems are not mandatory for this type of aircraft.

1.11.1 Garmin-Aera 660

The TP used a portable Garmin Aera 660 GPS device as a supplementary navigation tool. Data recorded by the device was retrieved and analysed to understand the flight's progression and the circumstances leading up to the occurrence. However, the recorded data only provided the flight's navigation route and did not include other information on the aircraft's flight profile, such as altitude, speed, climb rate, or descent rate. Moreover, the GPS device did not have a removable memory card.

1.12 Wreckage and Impact Information

The aircraft suffered significant damage after striking trees and crashing into the ground. The crash location coordinates are shown in Figure 5. Figure 6 illustrates the aircraft's trajectory before the crash, while Figure 7 depicts its post-accident condition.



Figure 5: Crash location⁹

⁹ Source: Data from the Garmin Aera 660 was overlaid onto Google Earth.



Figure 6: The trajectory of the aircraft before impact with the ground



Figure 7: Post-accident conditions of the aircraft at the crash site

1.13 Medical and Pathological Information

As a result of the accident, both crew members suffered serious injuries. Medical assessment indicated that the TP sustained facial injuries, a fractured nasal bone, and a torn ligament in the right leg. Meanwhile, the Safety Pilot sustained a fractured right leg and minor abrasions.

Both the TP and Safety Pilot also underwent urine drug panel screenings, and the results were negative for substance abuse.

1.14 Fire

There was no evidence of fire either before or after the accident.

1.15 Survival Aspects

Both aircrew members received initial assistance from members of the public at the crash site before being safely rescued by the Malaysian Fire and Rescue Department. They were then transported to the nearest hospital for treatment. The TP and Safety Pilot sustained serious injuries but remained in stable condition.

1.16 Tests and Research

The investigation did not reveal any abnormalities in the aircraft's systems or failures of major components. Maintenance and servicing records confirmed that there were no deferred maintenance actions, and the aircraft was verified to be in airworthy condition and fully serviceable prior to the flight. Additionally, neither aircrew member reported any abnormalities or malfunctions in any systems or components before or during the flight. Therefore, laboratory tests were not deemed necessary for any systems, components, or aircraft parts.

1.17 Organisational and Management Information

1.17.1 Aircraft Owner and Operator

LLFA Sdn. Bhd. is the owner, and LLFA lpoh is the operator of the Cessna 172N, registered as 9M-ADA. Since 2019, LLFA Sdn. Bhd. has been an Approved Training Organisation (ATO) accredited by CAAM for pilot training in both airplanes and helicopters. LLFA regularly operates its aircraft from WMKI in Ipoh, Perak.

1.17.2 Aerodrome Operator

The accident occurred outside the aerodrome boundaries. For additional information, LLFA operates its aircraft from WMKI, where the aerodrome operator is Malaysia Airports Sdn. Bhd. (MASB). MASB is licensed by the Ministry of Transport Malaysia to operate, manage, and maintain the airport facilities.

1.18 Additional Information

The investigation team conducted separate interview sessions with the TP, Safety Pilot (AFI), LLFA Chief Flying Instructor, LLFA Safety Manager, LLFA Head of Base Engineering, LLFA CAMO, KLATCC on-duty controllers, and Ipoh ATC on-duty controllers. All interview sessions were recorded with the full knowledge and consent of the parties involved. Key information was obtained from the interviews with the TP and Safety Pilot.

1.19 Useful or Effective Investigation Techniques

Not applicable.

2.0 ANALYSIS

2.1 Introduction

The analysis framework for this investigation aims to provide clear and actionable insights into the accident. The approach begins by excluding factors that are clearly unrelated to the incident.

The main analysis focuses on the statements from the TP and Safety Pilot, which provide first-hand information about the events leading up to and during the accident. These statements are crucial for understanding the pilots' actions, decision-making processes, and any deviations from standard procedures. The analysis also considers environmental factors (such as weather conditions) and operational factors. Ultimately, the goal is to identify the root causes and contributing factors to help prevent future occurrences.

2.2 On-site Investigation

The investigation team visited the crash site and visually inspected the aircraft wreckage to gather physical evidence crucial for understanding the event. It was observed that the aircraft had impacted the ground in a severely damaged condition. The aircraft came to rest in an almost inverted position, surrounded by tall trees at the top of a hill, as shown in Figure 8.



Figure 8: Post-accident condition of the aircraft

It was also observed that the trees at the crash site had an average height of approximately 30 to 40 ft, with an average spacing of around 10 ft between each tree, as shown in Figure 9.



Figure 9: Tall trees, averaging 30 to 40 ft in height and spaced approximately 10 ft apart, were located on the hill

Evidence suggests that the aircraft struck several tree branches and trunks before its final impact with the ground. Figure 10 also illustrates the aircraft's trajectory and descent path prior to the crash.



Figure 10: Aircraft trajectory into terrain and descent path before the crash

A visual inspection of the wreckage revealed that the left (LH) wing was damaged, showing more scratches from striking tree branches and trunks, while the right (RH) wing was bent and twisted upwards, as shown in Figure 11.



Figure 11: Conditions of left (LH) and right (RH) wing after accident

Both wing struts were found to be severely damaged. The wing assembly sustained impact forces from tree branches, trunks, and the collision with the ground. It is likely that the LH side of the aircraft struck the tops of tree branches first, leading to a loss of control. The aircraft then struck with several more branches and trunks before impacting the ground. This impact crushed the LH wing and caused the RH wing to bend and twist upwards, ultimately leaving the aircraft resting in an almost inverted position, as shown in Figure 12.



Figure 12: Position of right (RH) wing after aircraft impacting the ground

Despite sustaining severe damage, the aircraft's impact was likely cushioned by the tree canopy, and both crew members were extremely fortunate to have survived the crash. As the aircraft struck and descended through the trees, the tree canopy helped dissipate its speed and momentum before it made final contact with the ground.

2.3 Non-Causal Factual Information

2.3.1 Flight Operations Information

The aircraft 9M-ADA departed from WMKI at 0759 LT for an authorised Navigation Exercise (NAVEX). The training route began at WMKI and included the waypoints Ayer Tawar, Pulau Pangkor, Teluk Intan, Sabak Bernam, Tanjung Karang, Ulu Bernam, Sungkai, Bidor, Kampar, and Gopeng before returning to WMKI.

At approximately 0900 LT, while passing over Sabak Bernam, the TP observed adverse weather ahead, preventing the flight from proceeding to its final southern waypoint, Tanjung Karang. Data from the Garmin Aera 660 shows that the flight deviated in the Sekinchan area, turning back northward at a distance of approximately 5.00 nm (9.26 km) from Tanjung Karang. The flight then proceeded to the next waypoint, Ulu Bernam, on its return route to WMKI, as shown in Figure 13.



Figure 13: Distance from the aircraft's turnback point to the last waypoint - Tanjung Karang¹⁰

With reference to the crash location, Garmin data showed that the flight had slightly deviated to the right of the planned route, most likely to avoid the weather. The deviation from the planned route was approximately 0.31 nm (0.58 km). The data

¹⁰ Source: Data from the Garmin Aera 660 was overlaid onto Google Earth.

indicates that the flight was attempting to return and was on track northward to WMKI, as shown in Figure 14.



Figure 14: Crash location vs planned training route and distance of deviation¹¹

¹¹ Source: Data from the Garmin Aera 660 was overlaid onto Google Earth.

2.3.2 Solo Training Flight

On the day of the accident, the sortie was authorised as a student's solo navigation training flight, referred to as the NAVEX 3A route. Due to persistent unfavourable weather conditions since April 2024 and the forecast for May 2024, LLFA assigned an instructor as a 'Safety Pilot' to accompany the Trainee Pilot (TP), as indicated in the Flight Authorisation Sheet (see Figure 15).

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Figure 15: LLFA's Flight Authorisation Sheet

This precautionary measure, particularly for cross-country flights, is outlined in Appendix E of LLFA's Internal Memo, '*Guidelines for Safety Pilot Roles and Responsibilities during Trainee Pilot Solo Flights*'.

However, the proactive measures taken by LLFA, such as assigning an instructor as a 'Safety Pilot' during TP's solo flights due to unfavourable weather conditions without any approval by the Regulator seems violate to CAD 1011: Approved Training Organisation, Chap.3, Para 3.1.5 (see Figures 16 and 17).

Significant means in the context of the medical provisions in Chapter 6, significant means to a degree or of a nature that is likely to jeopardise flight safety. Solo flight time means flight time during which a student pilot is the sole occupant of an aircraft. State safety programme (SSP) means an integrated set of regulations and activities aimed at improving safety. Threat means events or errors that occur beyond the influence of an operational person, increase operational complexity and must be managed to maintain the margin of safety. Threat management means the process of detecting and responding to threats with countermeasures that reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired states

Figure 16: Excerpt from Civil Aviation Directive (CAD)-1011: Approved Training Organisation (ATO), Chapter 3-Training, Para 3.1.5, page 3-1

	The training programme shall comply with the requirements of CAD 1 – PEL.
3.1.3	Flight training in an FSTD and theoretical knowledge instruction shall be phased in such a manner as to ensure that students are able to apply to flight exercises the knowledge gained on the ground. Arrangements should be made so that problems encountered during instruction can be resolved during subsequent training.
3.1.4	The ATO shall develop a training programme covering all aspects of the course and the ATO shall obtain CAAM's approval for the programme prior to implementation. The programme shall include phase by phase presentation of:
	a) The ground training and a syllabus summary
	b) Flight training and flight simulator (if applicable) standard exercises.
3.1.5	The ATO shall conduct the training in accordance with the approved training programme. The ATO shall obtain the CAAM's approval for any changes to the approved training programme prior to implementing the changes.

Figure 17: Excerpt from Civil Aviation Directive (CAD)-1011: Approved Training Organisation (ATO), Chapter 3-Training, Para 3.1.5, page 3-1

Furthermore, CAAM confirmed that LLFA has not officially applied to designate an instructor as a 'Safety Pilot' for student solo flights in unfavourable weather conditions, as detailed in Appendix F.

2.3.3 Injuries to Persons

Both crew members sustained serious injuries but survived the accident.

2.3.4 Aircraft Damage

The aircraft sustained major damage in the crash, and LLFA confirmed that it was classified as Beyond Economical Repair (BER).

2.3.5 Pilot Flying Experience

Summary of the TP's total flying experience (in hours), as shown in Table 7 below:

1	Total flying hours	85.00 hrs
2	Pilot-in-Command (PIC) in last 24 hrs	0 hrs
3	PIC in last 7 days	1.30 hrs
4	PIC in last 30 days	8.30 hrs
5	PIC in last 90 days	38.30 hrs
6	Total hours in Solo Flight	15.00 hrs
7	Total hours in Dual Navigation Flight (with instructor)	10.00 hrs
8	Total hours in Solo Navigation Flight	9.00 hrs
9	Number of sorties in the solo navigation flight on the day of the accident	Sortie no.4 of 9

Table 7: Summary of the TP's flight record¹²

The flight record shows that the TP was authorised, in accordance with approval procedures, to perform the solo navigation training flight on the day of the accident.

2.3.6 Aircraft Information

The aircraft, a 1983 Cessna 172N registered as 9M-ADA, was deemed airworthy and fully serviceable at the time of the accident. The investigation confirmed that all

¹² Source: Information provided by LLFA.

required corrective and preventive maintenance activities had been completed satisfactorily.

The most recent Base Maintenance was performed on 21 April 2024, at 15,462.10 airframe hours, including the Operation-2 Inspection and the 50-hrs and 100-hrs Engine Maintenance Checks. No abnormalities were recorded, and there were no deferred maintenance issues. The aircraft exhibited no significant defects in any major components or systems, and the aircrew reported no issues during the flight prior to the accident.

2.3.7 Navigational Aids and Communication.

All navigation aids and ATC communications were functioning normally at the time of the accident. Therefore, navigational aids and communication were not contributing factors to the cause of the accident.

2.3.8 Flight Recorders.

The aircraft was not equipped with flight recorders, such as an FDR or a CVR. Additionally, the data retrieved from the Garmin Aera 660 only provided flight logs including the date, route, and flight time—up to the time of the crash.

2.3.9 Wreckage and Impact Information.

The main wreckage and engines were located and identified. The aircraft sustained severe damage upon ground impact, which has been classified as BER, as stated in the Initial Damage Assessment Report in Appendix A.

2.3.10 Medical and Pathological Information.

Both crew members sustained serious injuries in the accident. Medical reports for both indicated no signs of alcohol or illicit drug influence.

2.3.11 Fire.

There was no fire before or after the accident.

2.4 Accident Analysis

2.4.1 Aircraft Flight Operation Analysis

Flight LYG 1531, an aircraft registered as 9M-ADA, departed WMKI at 0759 LT for an authorised navigation training flight. The initial phase of the flight was uneventful, with favourable weather conditions as the aircraft proceeded southward, passing over the waypoints of Ayer Tawar, Pulau Pangkor, Teluk Intan, and Sabak Bernam. The cruise altitude was maintained at 4,000 ft throughout the first leg of the training route.

However, at approximately 0900 LT, while passing over Sabak Bernam, the TP observed adverse weather ahead, preventing the flight from continuing to its final southern waypoint, Tanjung Karang. The TP decided to deviate from the planned route in the Sekinchan area and turn back toward the northern waypoints at Ulu Bernam and Sungkai for a return to WMKI. Unfortunately, adverse weather—characterised by cloud cover at 4,000 ft—was also encountered while approaching Ulu Bernam. These conditions persisted as the flight gradually descended to 2,500 ft.

At 0924 LT, while continuing to fly over the Ulu Bernam area, the TP encountered cloud cover again at an altitude of 2,500 ft. Following advice from the Safety Pilot, the TP decided to descend further to 1,000 ft to maintain visual contact with the terrain. After receiving clearance from KLATCC, the flight gradually descended to that altitude.

While descending to 1,000 ft, the Safety Pilot took control of the aircraft. However, shortly after reaching this altitude and attempting to level off, the aircraft inadvertently entered IMC. With visibility lost, the Safety Pilot struggled to maintain visual contact with the terrain, leading to a likely loss of orientation and situational awareness— particularly regarding the high ground surrounding the aircraft's position. As a result, the aircraft unintentionally struck the tree canopy, became uncontrollable, and collided with multiple branches and trunks before crashing to the ground. Figure 18 illustrates

the sequence of events, based on witness interviews, as well as data from the Garmin device and METAR reports.



Figure 18: Illustration of the entire sequence of events¹³

The decision to descend to a lower altitude (1,000 ft) amid worsening weather conditions contradicted LLFA's Training and Procedures Manual, which state: "*The*

¹³ Source: Data from the Garmin Aera 660 was overlaid onto Google Earth, along with METAR data (WMKI) and witness interviews.

aircraft commander must avoid flying below 1,500 ft above the ground, water, or any obstruction at any time when outside the vicinity of an aerodrome" (refer to Figure 19).

11.2.3. Minimum safety altitudes (Lowest safety altitudes LSALT).

11.2.3.1. General Policy

In addition to observing the rules contained in Air Legislation and Air Traffic Control Regulation, in regard to heights over town and gatherings of people, aircraft commander <u>must avoid flying less than 1500 feet above the</u> ground or water or obstruction thereon, at any time when outside the vicinity of aerodrome.

Figure 19: Excerpt from LLFA's Training and Procedures Manual (TPM)-Routes, Part 11, Chap.2, page 2

Additionally, the Student Study Guide states: "*Normally, you should not descend through cloud unless under the control of ATC. Never continue a descent below the safety altitude in cloud unless you are following an authorized procedure*" (refer to Figure 20).

8.3.2. Safety Altitude

Normally you should not descend through cloud unless under the control of ATC. Never continue a descent below safety altitude in cloud unless you are following an authorized procedure.

It is important that you cross check the altimeters during a descent and that you are aware that altimeter readings may lag during a very rapid descent.

Figure 20: Excerpt from LLFA's Student Study Guide, Chap 8-Descending, page 31

Furthermore, the SOP specifies: "*Calculation of VFR MSA are the elevation of the highest ground within 20 nm on either side of the track plus 1,500 ft*" (refer to Figure 21).
MINIMUM SAFE ALTITUDES

5. Calculations of VFR MSA are the elevation of the highest ground within 20 nm either side of track plus 1500 ft.

Figure 21: Excerpt from LLFA's Cessna C172 SOP-Navigation, Chap. 4, page 70

According to the additional notes, the Cessna 172 used by LLFA limits the aircraft for VFR flight training (refer to Figure 22).

CHAPTER 1.

- 10.1 CERTIFICATION AND OPERATING LIMITATIONS.
- 10.1.1. Type of for aeroplane for flight training.

Aeroplane type	Certification	Operating limitations
Cessna 172	FAR23	VFR
Piper 28	FAR23	VFR
Piper 34 Seneca	FAR23	VFR and IFR

Figure 22: Excerpt from LLFA's TPM – Aircraft Operating Information, Part 10, Chap.1, page 1

2.4.1.1 Conclusion – Aircraft Operation Analysis

The sequence of events leading to the accident highlights several critical factors. While the flight initially proceeded without issues, deteriorating and inconsistent weather conditions during the return to WMKI prompted the TP—on the Safety Pilot's advice— to descend to 1,000 ft in an attempt to maintain visual contact with the terrain. However, as the Safety Pilot took control during the descent and attempted to level off, the aircraft inadvertently entered low clouds and fog, leading to Unintended Flight in IMC (UIMC). This likely made it difficult for the Safety Pilot to regain visual contact with the terrain, resulting in a loss of orientation and situational awareness, ultimately leading to Controlled Flight into Terrain (CFIT).

To avoid clouds and IMC, both crew members (TP and Safety Pilot) made a poor judgement call by flying at a low altitude (1,000 ft), relying on visual references to

maintain low-level flight—a practice known as 'scud running'¹⁴—instead of climbing to a safe altitude before entering adverse weather. These actions ultimately compromised operational safety and led to a collision with trees, followed by impact with the ground.

The findings emphasise the importance of maintaining situational awareness and adhering to established protocols when operating in adverse weather conditions. To mitigate similar occurrences, it is imperative to enhance training on VFR operations, with a focus on emergency procedures and managing encounters with severe weather. Additionally, robust pre-flight planning, thorough weather assessments, heightened situational awareness, and clear decision-making protocols are essential to ensuring flight safety.

2.4.2 Meteorological Factor Analysis

The METAR for WMKI indicated a few clouds at 500 ft AGL and scattered clouds at 2,600 ft AGL starting at 0700 LT on 4 May 2024, while the TAF report for WMKI predicted a few clouds at 2,000 ft AGL from 0800 LT on 4 May 2024 until 0800 LT on 5 May 2024. A detailed METAR report for WMKI is provided in Appendix C.

During the initial stage of the flight, the departure area at WMKI and the waypoints of Ayer Tawar, Pulau Pangkor, Teluk Intan, and Sabak Bernam experienced favourable weather. However, as the aircraft approached Tanjung Karang, the TP encountered adverse weather conditions, including low and dark clouds, which prevented the flight from proceeding further.

While turning back toward the northern waypoints at Ulu Bernam and Sungkai, the flight encountered adverse weather again, with cloud cover at 4,000 ft near the Slim River area. The TP gradually initiated a descent to 2,500 ft; however, clouds persisted at this altitude. To maintain visual contact with the terrain, the TP decided to descend further to 1,000 ft on the advice of the Safety Pilot. While descending to this altitude,

¹⁴ Scud running refers to the practice of flying at a low altitude to maintain visual contact with the ground while trying to avoid Instrument Meteorological Conditions (IMC), such as clouds or poor visibility. Pilots do this instead of relying on their instruments or following proper IFR (Instrument Flight Rules) procedures.

the Safety Pilot took control of the aircraft and attempted to level it off. Unfortunately, the aircraft inadvertently entered adverse weather conditions (IMC), resulting in a loss of visibility.

As shown in Figures 23A, 23B, and 23C, weather satellite images¹⁵ from Himawari-9 indicate the presence of medium clouds and high clouds between 0920 and 0940 LT within a 10 nm radius of Sungkai (highlighted in the 'red box'). For reference, the distance between Sungkai and the crash site (Slim River) is approximately 8.0 nm, and Slim River falls within the 'red box'. The images show no 'convective cloud'. However, the Surface Weather Observation Report by MET Malaysia confirmed the presence of humid conditions, low clouds, and fog between 0900 LT and 1000 LT within a 10 nm radius of the Sungkai area. A detailed weather analysis and a report are provided in Appendix D.

¹⁵ Source: MET Malaysia.



Figure 1: Himawari-9 Infrared (09.20am)



Figure 3: Himawari-9 Infrared (09.40am)



Figure 2: Himawari-9 Infrared (09.30am)

- i. Satellite Himawari-9 Infrared Band (Band 13) Images (Figures 1, 2, and 3) show the light grey colour shade that indicate medium to high cloud existence between 9.20 and 9.40 a.m. LT in the indicated area.
- ii. Comparison with other satellite images (Visible Band and Cloud Type Product) is required to clarify this cloud.

Figure 23A: Weather Satellite imagery by MET Malaysia



Figure 23B: Weather Satellite imagery by MET Malaysia





As a result of entering adverse weather, the Safety Pilot likely lost both orientation and situational awareness, causing the aircraft to unintentionally collide with the tree canopy and lose control. The aircraft then struck several more trees before ultimately impacting the ground. Consequently, the weather conditions appear to have been a major contributing factor to the accident.

2.4.2.1 Conclusion – Meteorological Factors Analysis

When the flight was unable to continue to Tanjung Karang due to adverse weather, the TP decided to turn back and fly northward towards Ulu Bernam. Upon passing over Ulu Bernam, the TP encountered clouds at 4,000 ft, prompting a gradual descent to 2,500 ft. However, as the flight reached the Slim River area, the TP encountered further cloud cover at 2,500 ft and chose to descend to 1,000 ft in an attempt to regain visual contact with the terrain. At this point, the Safety Pilot took control of the flight,

managing the descent and levelling off at 1,000 ft. Unfortunately, the aircraft then inadvertently entered IMC.

This poor judgement led to a critical loss of visibility under IMC conditions. As a result, the Safety Pilot likely lost both orientation and situational awareness, causing the aircraft to unintentionally strike tree branches and trunks. The aircraft became uncontrollable, colliding with several more trees before ultimately impacting the ground.

Adverse weather was clearly a significant contributing factor to the accident. To enhance safety and prevent similar incidents, improvements are needed in weather training, pre-flight weather briefings, attitude management procedures, and communication protocols between pilots and ATC.

2.4.3 Human Factor Analysis

Human factor issues related to this accident were examined, focusing on the pilot's actions, decision-making and potential errors.

2.4.3.1 Compliance with Standard Operating Procedures (SOP)

The Cessna 172N in this accident was a VFR aircraft, as was the training sortie. Both crew members should have avoided the adverse weather; however, the decision to descend to 1,000 ft in worsening conditions exacerbated the situation. At this point, poor decision-making and judgement led the aircraft into IMC, further compounding the risks and resulting in a loss of visual reference, followed by a collision with trees before striking the ground.

This accident suggests that both crew members' actions were not in compliance with the aircraft's SOP and the LLFA's Training and Procedures Manual (TPM). Noncompliance with these procedures undermines safety protocols and significantly increases the likelihood of errors, especially in high-stress or emergency situations.

2.4.3.2 Training and Competency

The TP had limited flying hours, as well as limited experience with this aircraft type. According to the TP's logbook, the total flight time on this aircraft type was 84.3 hours, including 15 hours of solo flight, 10 hours of dual navigation flight (with an instructor), and only 9 hours of solo navigation flight.

Meanwhile, the Safety Pilot (AFI) had recorded 287.1 flying hours on this aircraft type. LLFA management stated that the AFI had transferred from LLFA Kota Kinabalu, Sabah (East Malaysia) only a few months before the accident. It is likely that the AFI was less familiar with the environment and terrain of Peninsular Malaysia, which could be a significant factor when facing unexpected or emergency situations, such as the one in this accident.

Adequate training and familiarity with both the aircraft and the environment are critical for its safe and effective operation, especially when managing in-flight challenges and emergencies. The TP's limited training and experience with this aircraft may have adversely affected the ability to respond effectively to unexpected situations, potentially compromising safety. Meanwhile, a lack of familiarity with the environment may have caused the Safety Pilot to lose orientation and situational awareness, especially when encountering deteriorating weather.

2.4.3.3 Decision-Making and Judgement

Both crew members (TP and Safety Pilot) made poor decisions and demonstrated flawed judgement by flying into adverse weather. The flight descended to a low altitude (1,000 ft), causing the aircraft to enter IMC and lose visual contact with the terrain. This accident raises concerns about the pilots' judgement and risk assessment. Such decisions may indicate overconfidence in their abilities or an underestimation of the risks associated with deviating from established procedures. Effective decision-making, especially in high-stakes situations, requires a thorough understanding of potential outcomes and strict adherence to safety protocols.

2.4.3.4 Workload Management

After descending to a lower altitude (1,000 ft) and entering adverse weather (IMC), the Safety Pilot likely experienced an increased workload and heightened stress, which may have affected the ability to maintain situational awareness and execute necessary actions accurately. Effective workload management is crucial for maintaining focus, ensuring tasks are performed correctly, and sustaining situational awareness— especially during critical phases of flight.

2.4.3.5 Situational Awareness

Situational awareness involves understanding the current environment, anticipating future developments, and recognising changes that could impact safety. Both crew members (TP and Safety Pilot) demonstrated poor decision-making by attempting to escape the weather. The descent to 1,000 ft in IMC, combined with being trapped in adverse weather, led to a loss of situational awareness. While trying to regain visual contact with the terrain, the Safety Pilot failed to adequately assess the risks of potential hazards. Maintaining situational awareness is crucial, especially during emergencies, to effectively manage the situation, minimise risks, and ensure a safe outcome.

2.4.3.6 Conclusion – Human Factors Analysis

The human factors analysis identifies key areas where deviations from standard procedures, insufficient training and experience, and poor judgement and decision-making likely played significant roles in the accident. To prevent similar occurrences, it is crucial to emphasise adherence to established protocols, provide comprehensive and recurrent training, and foster a safety culture that prioritises SOP compliance and strong risk management principles.

3.0 CONCLUSION

The accident was not caused by maintenance or system failure but was primarily related to flight operations. Key issues included mishandling of the aircraft by both the TP and Safety Pilot, suggesting a failure to follow SOPs or lack of sufficient training. Poor decision-making and judgement in responding to adverse weather conditions, including descending to 1,000 ft in low visibility, significantly increased the risk of collision with terrain.

The Safety Pilot's role was also problematic, as their presence did not provide adequate support during the adverse weather encounter and was in violation of regulations.

The aircraft's unintentional collision with trees, located at the top of a hill, further demonstrated unsafe flight practices. The accident highlights the importance of proper training, adherence to protocols, effective decision-making, and clear communication, especially in challenging conditions.

3.1 Findings

The investigation revealed several key findings, as follows:

3.1.1 Pilot Qualifications and Health Status

- The TP and Safety Pilot were properly licensed and qualified, but the Safety Pilot's presence on this solo flight violated CAAM regulations.
- (2) The TP's and Safety Pilot's medical certificates were valid at the time of the accident, and both were medically fit and adequately rested to operate the training flight.
- (3) Urine drug panel tests for both aircrew members returned negative results for substance abuse.

3.1.2 Aircraft Status

- (1) The aircraft had a valid C of A and C of R and was in a serviceable, airworthy condition at dispatch.
- (2) Maintenance complied with regulations, with no recorded issues or major defects, and the pilot reported no technical problems before the accident.
- (3) The absence of an FDR and CVR, along with the Garmin Aera 660 not providing a detailed flight profile, limited investigation data.
- (4) Post-accident assessment confirmed major damage from a hard ground impact, rendering the aircraft a total loss.

3.1.3 Environmental Conditions

- (1) The accident occurred near Slim River at 0935 LT in daylight. Inconsistent adverse weather had persisted since April 2024 and was predicted to continue until May 2024.
- (2) Adverse weather conditions, including low clouds and fog near the crash site, contributed to the accident.
- (3) The crew encountered adverse weather near Tanjung Karang, then cloud cover at 4,000 ft over Ulu Bernam and another layer at 2,500 ft near Slim River.

3.1.4 Pilot Actions

(1) The TP and Safety Pilot exercised poor judgment and decision-making by descending to an unsafe altitude of 1,000 ft in adverse weather conditions, attempting to regain visual contact with the terrain. This decision led to a loss of situational awareness and contributed to the accident. (2) The TP and Safety Pilot's actions deviated from the aircraft's SOP and the LLFA's Training and Procedures Manual (TPM), including the unsafe descent and failure to maintain proper altitude, which contributed to the accident.

3.1.5 Solo Flight Sortie

The flight was authorised as a student solo sortie, but LLFA assigned a Safety Pilot, violating CAAM regulations.

3.2 Cause and Contributing Factors

3.2.1 Cause

The accident was primarily caused by poor judgement and decision-making by both crew members, compounded by a loss of situational awareness by the Safety Pilot when encountering adverse weather. The aircraft's descent to a low altitude of 1,000 ft in deteriorating conditions led to inadvertent entry into IMC, resulting in a loss of visual contact with the terrain. As a result, the aircraft unintentionally collided with trees, became uncontrollable, and ultimately crashed to the ground.

3.2.2 Contributing Factors

Rapidly changing and adverse weather conditions led to poor visibility and a lack of visual reference.

3.2.3 The Aviation Occurrence Code

This accident is coded as an Unintended Flight in IMC (UIMC) and Controlled Flight into Terrain (CFIT).

4.0 SAFETY RECOMMENDATION

The following safety recommendations are proposed to prevent future incidents, with a particular focus on enhancing safety and avoiding CFIT events.

LLFA is recommended to:

- (1) Provide relevant training resources and simulators to ensure that pilots maintain proper flight skills and proficiency.
- (2) Prioritise enhancing pilots' decision-making skills.
- (3) Improve the quality of weather briefings provided to pilots, ensuring they are thorough, complete, and accurate.
- (4) Ensure that pilots maintain a high level of situational awareness during all phases of flight, particularly in adverse weather conditions.
- (5) Strictly comply with current CAAM directives and regulations, particularly regarding student solo flight sorties conducted without an instructor's in-flight supervision.

5.0 COMMENTS TO DRAFT FINAL REPORT

In accordance with ICAO Annex 13, paragraph 6.3, the Draft Final Report was sent to the State of Design and Manufacturer (The National Transportation Safety Board - NTSB, USA), Civil Aviation Authority of Malaysia (CAAM), as well as the aircraft operator inviting their significant and substantiated comments on the report. The following (Table 8) is the status of the comments received:

Organisations	Status of Significant and
	Substantiated Comments
NTSB, United States of America	No comments received
CAAM, Malaysia	No comments received
Operator	No comments received

Table 8: Status of significant and substantiated comments

CONCLUDING STATEMENT

This investigation has revealed instances of non-compliance and errors; however, it is crucial to emphasise that these findings are not intended for the purposes of apportioning blame or liability. Rather, they are solely for the purpose of preventing accidents in the future and improving aviation safety on the whole. Addressing the identified findings and implementing the recommended safety measures will enhance aviation safety and mitigate risks associated with operational lapses and regulatory gaps. It is imperative that all stakeholders prioritise safety and commit to implementing the necessary measures to prevent recurrence.

INVESTIGATOR IN-CHARGE

Air Accident Investigation Bureau (AAIB) Ministry of Transport Malaysia

APPENDIX A

INITIAL DAMAGE ASSESSMENT REPORT







Layang Layang Aerospace Sdn. Bhd.(243883-v)

INITIAL DAMAGE ASSESSMENT 9M-ADA CRASH AT GUNUNG BESOUT , SUNGKAI Document Number: LLA/IDM/2024/03

Aircraft Registration: 9M-ADA

ACCIDENT / INCIDENT DETAILS

Accident / Incident	Aircraft Crashed at Gunung Besout	
Accident / Incident Category	MOR	NON-MOR
Name of the Operator	LAYANG LAYANG FLYING ACADEMY	
Operator Type	AOC	NON AOC
Date of Incident	04 MAY 2024	
Time of Incident	0935 Hours	
Date of MOR Submitted	05 MAY 2024	

AIRCRAFT DETAILS

Aircraft OEM	Textron Aviation Inc	
Model	Cessna 172 N	
Aircraft Serial Number	17268288	
Registration Marks	9M-ADA	
Airframe Hours	15481:55	
Engine Hours	1903:15	
Last Base Maintenance	Airframe Hours	Date
	15462:10	27 APR 2024
Last Maintenance Activities	Type of Maintenance	Date
	Operation 2 Inspection, 50H Engine and 100H Engine	27 APR 2024

LLA-F-209-00 Page 3 | 17



Layang Layang Aerospace Sdn. Bhd. (243883-v)

INITIAL DAMAGE ASSESSMENT 9M-ADA CRASH AT GUNUNG BESOUT , SUNGKAI Document Number: LLA/IDM/2024/03

Aircraft Registration: 9M-ADA

SUMMARY OF THE ACCIDENT

It was an authorized navigation training flight for the Trainee Pilot. Start up, Taxi and Take Off were uneventful. Aircraft take off from WMKI at time 0754H for navigation route 3A south bound until Tanjung Karang. Last contact was with KLATCC at time 0935H on route to Sungkai. The flight should have reported again at BIDOR at estimated time 0938H but no transmission was received by LYG 1531. Ipoh tower attempted radio call but no transmissions was received.

At time 0955H Layang Layang operation room Ipoh received a call from pilot's sister and informing that the aircraft was involved in an air accident. Both pilot and trainee pilot are safe with some injuries and brought to Slim River General Hospital.

The aircraft sustained major damages. The root cause and contributing factors are still under investigation and to be determined.

LLA-F-209-00 Page 4 | 17



Layang Layang Aerospace Sdn. Bhd. (243883-v)

INITIAL DAMAGE ASSESSMENT 9M-ADA CRASH AT GUNUNG BESOUT , SUNGKAI Document Number: LLA/IDM/2024/03

Aircraft Registration: 9M-ADA

INITIAL DAMAGE ASSESSMENT OVERVIEW

The Initial Damage Assessment Report (IDA) serves as a crucial tool for evaluating the preliminary damage incurred by an aircraft through a comprehensive physical inspection. Aircraft undergoing Mandatory Occurrence Report (MOR) are mandated to undergo quarantine until the completion of the initial investigation by the Aircraft Accident Investigation Bureau (AAIB) and the Civil Aviation Authority of Malaysia (CAAM).

The primary objective of the Initial Damage Assessment Report is to provide a systematic and analysis of the initial damage sustained by the aircraft. This report is instrumental in facilitating a thorough understanding of the extent of damage, enabling timely decision-making and subsequent corrective actions.

The assessment process involves a physical inspection carried out by qualified personnel. The findings are then documented in the Initial Damage Assessment Report, ensuring accuracy and completeness. The aircraft remains under quarantine to facilitate the unhindered investigation conducted by the AAIB and CAAM.

Upon release by the AAIB, a comprehensive and thorough inspection assessment will be conducted by qualified personnel. This in-depth evaluation aims to delve deeper into the damage identified during the initial assessment. The findings of this extensive inspection will be documented in the **Damage Assessment Inspection Report (DAI)**.

The Initial Damage Assessment Report, in conjunction with the subsequent Thorough Inspection Assessment, plays a pivotal role in the aviation safety protocol. By adhering to established procedures and involving the relevant authorities, these reports contribute to the overall safety and integrity of aviation operations.

LLA-F-209-00 Page 5 | 17























INITIAL DAMAGE ASSESSMENT CONCLUSION

I, Mohammed Zahid bin Mohammed Zubaid holding LLA Approval Number [LLA 08], hereby declare that all information presented in this Initial Damage Assessment Report is accurate. This report will serve as the foundation for the assessment. There will be no further assessments to be carried following the damage that had occurred on the aircraft. Hence, I would like to declare that the status of aircraft is considered Beyond Economical Repair.

LLA-F-209-00 Page 16 | 17

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Layang Layang Aerospace Sdn. Bhd.(243883-v)

INITIAL DAMAGE ASSESSMENT

9M-ADA CRASH AT GUNUNG BESOUT , SUNGKAI Document Number: LLA/IDM/2024/03

Aircraft Registration: 9M-ADA

LLA-F-209-00 Page 17 | 17

APPENDIX B

CERTIFICATE OF REGISTRATION (C of R) AND CERTIFICATE OF AIRWORTHINESS (C of A)

CAAM	PIHAK B C/V	VIL AVIATION AUTHORITY OF MALAYSIA VIL AVIATION AUTHORITY OF MALAYSIA PERAKUAN PENDAFTARAN ERTIFICATE OF REGISTRATION	No. AR/17/150
Tanda-Tanda Kenega Nationality and I 9M-/	rean dan Pendaftaran Registration Marks	Pembuat dan Nama Sebutan Kapal Udara Manufacturer and Manufacturer's Designation of Aircraft TEXTRON AVIATION INC. 172N	Nombor Siri Kapal Udara Aircraft Serial Number 17268288
Nama dan Alamat Pemunya Name and Address of Owner	LAYANG LAYANG FU LAYANG LAYANG CO TERMINAL 2, KKIA, C TANJUNG ARU, 8810 SABAH.	YING ACADEMY SDN. BHD. OMPLEX, DLD AIRPORT ROAD, 30 KOTA KINABALU,	
Adalah dengan ini diper Konvensyen Penerbang peraturan yang dikelua	rakul bahawa kapal udan gan Awam Antarabangsa rkan di bawahnya.	a yang diperihalkan di atas telah dimasukan dalam Daftar K bertarikh 7 Disember 1944 dan Akta Penerbangan Awam 1	apal Udara menurut 969, dan peraturan-
t is hereby certified the	t the above described air	rcraft has been duly entered on the Aircraft Register in acco	dance with the Convention
on International Civil Au	rlation dated 7 December	r 1944 and with the Civil Aviation Act 1969 and regulations in	ssued thereunder.
on International Civil A Tarikh dikeluarkan Date of issue	vation dated 7 December 08-May-2023	r 1944 and with the Civil Aviation Act 1969 and regulations in	ssued thereunder.
on International Civil Av Tarikh dikeluarkan Date of issue Tarikh tarnat tempoh Date of expiry	viation dated 7 December 08-May-2023 07-May-2026	r 1944 and with the Civil Aviation Act 1969 and regulations in CAPT. NORAZMAN BINM Pihak Berkuasa Penerbangan A Civil Aviation Authority of	ssued thereunder.
on International Civil An Tarikh dikeluarkan Date of issue Tarikh tamat tempoh Date of expiry Nama penyewa atau p Name of hirer or charte	viation dated 7 December 08-May-2023 07-May-2026 Incerter, mengikut peratu rer, pursuant to regulatio	r 1944 and with the Civil Aviation Act 1969 and regulations in CAPT. NORAZMAN BINM Pihak Berkuasa Penerbangan A Civil Aviation Authority of uran 6(4) Peraturan-Peraturan Penerbangan Awam 2016. In 6(4) of Civil Aviation Regulations 2016.	ssued thereunder. AlfAup Awam Malaysia Malaysia

Figure B1: Certificate of Registration (C of R)

CAAM	PINAK BERKU CIVIL AV PERAKUJ CERTIF	AN KESELAMATAN TERBANG TCATE OF AIRWORTHINESS	
Tanda-Tanda Kenega Dan Pendaftaran Nationality and Registr Marks 9M-AD	raan Pemb Manufacture ation Cl	uat dan Nama Sebutan Kapal Udara er and Manufacturer's Designation of Aircraft ESSNA AIRCRAFT COMPANY 172N	Nombor Siri Kapal Udara Aircraft Serial Number 17268288
Kategori Category Perakuan Keselamatan 1944 dan Akta Penerba tersebut di atas yang di tersebut di ahad-had pe	RT 23 NORMAL CAT Ferbang ini dikeluarkan ngan Awam 1969 dan idapati layak untuk te anerbangan yang bersa	FEGORY menurut Konvensyen Penerbangan Awam Anta peraturan-peraturan yang dikeluarkan di bawa rbang jika disenggarai dan dikendalikan men bit.	arabangsa bertarikh 7 Disember ahnya, untuk kapal udara yang urut peraturan-peraturan yang
	thiness is issued pursi on Act 1969 and regula	uant to the Convention on International Civil Av ations issued thereunder, in respect of the abo	viation dated 7 December 1944 ve-mentioned aircraft, which is
This Certificate of Airword and with the Civil Aviation considered to be airworth limitations.	ny if maintained and op	erated in accordance with the foregoing regulati	ons and the pertinent operating
This Certificate of Airwoi and with the Civil Aviatic considered to be airworth limitations. Tarikh dikeluarkan Date of issue	ny if maintained and op 11 MAR 2024	erated in accordance with the foregoing regulati	Anworthmesn

Figure B2: Certificate of Airworthiness (C of A)

APPENDIX C

METEOROLOGICAL AERODROME REPORT (METAR) – WEATHER REPORT



Figure C1: Weather report by Aviation Weather Centre

Summary of Weather Information:

METAR WMKI: Meteorological Aerodrome Report for Sultan Azlan Shah Airport, Ipoh, Malaysia.

032300Z: date is on 3 May 2024, time is at 23:00 UTC (4 May 2024, 07:00 LT).

VRB02KT: variable direction winds at 2 knots (~3.7 km/h).

8000: visibility is 8 kilometres.

FEW005 SCT026: few clouds at 500 feet Above Ground Level (AGL), scattered clouds at 2,600 feet.

25/24: temperature is 25°C, with high humidity (dew point 24°C).

Q1010: Atmospheric Pressure is 1010 hPa (within normal atmospheric pressure range).

FTB804 040208 GG WMKKZQZX WMKKZRZX 040208 WMKKYMYX SAMS33 WMKK 040200 METAR WMAU 040200Z VRB04KT 8000 FEW004 SCT025 26/25 Q1011= METAR WMBA 040200Z VRB02KT 9999 FEW032 28/25 Q1011= METAR WMKA 040200Z 15006KT 110V170 9999 FEW020 30/26 Q1011= METAR WMKB 040200Z 07003KT 360V120 8000 FEW020 30/25 Q1011 NOSIG= METAR WMKB 040200Z 07003KT 360V120 8000 FEW020 30/25 Q1011 NOSIG= METAR WMKC 040200Z 25004KT 200V300 9999 FEW018 33/25 Q1010= METAR WMKD 040200Z VRB02KT 9999 FEW019 28/25 Q1010 NOSIG= METAR WMKE 040200Z VRB02KT 9999 FEW019 27/24 Q1012= METAR WMKI 040200Z VRB02KT 9999 FEW019 27/24 Q1012= METAR WMKI 040200Z VRB02KT 9999 -RA FEW010 FEW017CB SCT027 26/25 Q1012= METAR WMKN 040200Z VRB04KT 9999 FEW020 32/27 Q1010=

Figure C2: Weather report by KLATCC

Summary of Weather Information:

METAR WMKI: Meteorological Aerodrome Report for Sultan Azlan Shah Airport, Ipoh, Malaysia.

040200Z: date is on 4 May 2024, time is at 02:00 UTC (10:00 LT).

VRB02KT: variable direction winds at 2 knots (~3.7 km/h).

9999: visibility is about 10 kilometres.

FEW019: few clouds at 1,900 feet Above Ground Level (AGL).

27/24: temperature is 27°C, with high humidity (dew point 24°C).

Q1012: Atmospheric Pressure is 1012 hPa (within normal atmospheric pressure range).

APPENDIX D

(1) WEATHER SATELLITE AND RADAR IMAGES ANALYSIS

WEATHER SATELLITE AND RADAR IMAGE ANALYSIS ON 4TH MAY 2024, 9.20 TO 9.40 AM (LT) SATELLITE IMAGES i. Satellite Himawari-9 Infrared Band (Band 13) Images (Figures 1, 2, and 3) show the light grey colour shade that indicate medium to high cloud existence between 9.20 and 9.40 a.m. LT in the indicated area. ii. Comparison with other satellite images (Visible Band and Cloud Type Product) is required to clarify this cloud. Figure 1: Himawari-9 Infrared (09.20am) 101 7.6 Figure 2: Himawari-9 Infrared (09.30am) Figure 3: Himawari-9 Infrared (09.40am)

D-1



iii. Satellite Himawari-9 Visible images (Band 1), Figure 4, 5 and 6 that indicate medium to high cloud existence between 9.20 and 9.40 a.m. LT in the indicated area.


Summary:

Based on the Satellite Himawari-9 Infrared Band 13, Visible Band 1 and Himawari-9 Cloud Type Product, medium (≥400 and <600hPa) to high (<400hPa) cloud existed between 9.20am and 9.40 am LT in the indicated area. No convective cloud detected in the indicated area that can cause significant weather event.







0.00 mm/h precipitation.

Summary:

There were no precipitation observed by Kuala Gula Radar Station within 10nm of the coordinate 4°00'0.00"N, 101°18'60.00"E on 4 May 2024 from 9.20 am to 9.40 am.

Notes: Precipitation refers to any form of water—liquid or solid—that falls from the atmosphere to the Earth's surface. This includes rain, snow, sleet, and hail. It occurs when clouds become saturated with moisture, and the water droplets or ice crystals combine and become heavy enough to fall due to gravity.

(2) SURFACE WEATHER OBSERVATION REPORT



LAPORAN CUACA PERMUKAAN DI SEKITAR KAWASAN SUNGKAI, PERAK (KOORDINAT: 4°00'0.00"N 101°18'60.00E) PADA 4 MEI 2025

 Jabatan Meteorologi Malaysia (JMM) tidak mempunyai stesen pencerapan di kawasan Sungkai, Perak (Koordinat: 4°00'0.00"N 101°18'60.00E). Walau bagaimanapun, stesen-stesen pencerapan JMM yang terhampir ialah di Hospital Teluk Intan (± 29.5 km), Felda Sungai Behrang (± 29.9 km), Sitiawan (± 71.9 km) dan Ipoh (± 65.8 km) dari lokasi kejadian. Lakaran lokasi kedudukan stesen-stesen pencerapan cuaca adalah seperti di bawah



Gambarajah 1: Lokasi Stesen-stesen Pencerapan Cuaca

Disediakan oleh : Pusat Iklim Nasional Jabatan Meteorologi Malaysia Kementerian Sumber Asli dan Kelestarian Alam

1

 Secara amnya, kawasan di sekitar Sungkai, Perak mengalami keadaan yang keadaan lembap dan berawan rendah pada jam 9.00 pagi sehingga 10.00 pagi. Cerapan kelembapan bandingan (RH), litupan awan dan cuaca semasa setiap jam yang direkodkan di stesen-stesen pencerapan cuaca adalah seperti di bawah.

Jadual 2: Cerapan suhu, kelembapan bandingan (RH), litupan awan dan cuaca semasa setiap jam yang direkodkan di stesen-stesen pencerapan

Masa	Felda Sg. Behrang RH (%)	Hosp. Teluk Intan RH (%)	Pejabat Meteorologi Sitiawan			Pejabat Meteorologi Ipoh		
			Awan (Okta)	RH (%)	Cuaca semasa	Awan (Okta)	RH (%)	Cuaca semasa
7.00 – 8.00 pagi	100	83	1-2 (Datar atean rendah)200 kaki)	93	Jerebu	1-2 (Danae awan renitab 500 kaki)	93	Kabus (Mist)
8.00 – 9.00 pagi	97	77	1-2 (Dasar awan rendah 3200 kaki)	90	Jerebu	1-2 (Dwar uwan rendab n00 kaki)	91	Jerebu
9.00 – 10.00 pagi	94	77	1-2 (Davar awan rendah 3200 kaki)	80	Jerebu	1-2 (Datar awan rendah 1900 kaki)	85	Jerebu

Nota 1: Kelembapan relatif yang dikategorikan sebagai kabus (93% hingga 100% kelembapan relatif) ditulis dengan huruf tebal

 Berdasarkan analisis di atas, jabatan berpendapat terdapat kabus di lokasi kejadian pada jam 9.00 pagi schingga 10.00 pagi, 4 Mei 2024.

Disediakan oleh : Pusat Iklim Nasional Jabatan Meteorologi Malaysia Kementerian Sumber Asli dan Kelestarian Alam

2

APPENDIX E

LLFA INTERNAL MEMO – GUIDELINES FOR SAFETY PILOT

	INTERNAL MEMO
Ref:	Pilots Notice No. 10/2023
Attn:	All Flight Instructors
From:	HEAD OF TRAINING
Date:	IO October 2023
Subject:	Guidelines for "Safety Pilot" Roles and Responsibilities During Trainee Pilot Solo Flights
The above	subject referred,
The Safety Layang Fl options ha final recou	Pilot implementation is not actively promoted as a standard practice at Layang ying Academy. Nevertheless, in exceptional circumstances where all other ve been thoroughly explored and deemed insufficient, it may be factored as a rse.
Prior to co extensive compreher	ontemplating such a measure, the Chief Flight Instructor (CFI) will convene discussions with all relevant instructors, while the Safety Manager conducts a nsive risk assessment to identify and mitigate potential hazards.
Subsequer	ntly, the Head of Training, having duly informed the Accountable Manager and

The subsequent delineation details the overarching protocol for safety pilot roles and responsibilities during trainee pilot solo flights:

1. Pre-flight Preparation:

- 1.1 Review the flight plan and route with the Trainee Pilot.
- 1.2 Confirm weather conditions and any relevant NOTAMs (Notices to Airmen).
- 1.3 Ensure that all required safety equipment is on board and functional.

2. Briefing:

2.1 Conduct a thorough briefing with the Trainee Pilot covering emergency procedures, communication protocols, and the specific tasks to be practiced during the solo flight.

2.2 Clarify roles and responsibilities for both the Safety Pilot and the Trainee Pilot during the flight.

1





-		
10:	The safety Manager LDA	
rom:		
Date:	02 Mei 2024	
subject:	Unfavourable and volatile weather en-route X-Country Flights	
find it in and pose	perative to report to you on the present weather trends which in my mind is hazardous immense challenges (or even danger) to flight training especially for solo students. I base	
my assert	ions from the following flights I flew:	
1. 0 o a o d	n 22 April 2024 the routing for my flight was 6A ie to WMKI – Lintang – Selama and then bastal and south bound. I was unable to fly to Selama after Lintang as the CB clouds were t about 1000 feet right up to 7000 feet. A diversion to Beruas was made before joining bastal and south bound. Forward visibility along the coastal regions was about 5nm eteriorating to 3nm around the Slim River area.	
2. C 0 b	On 23 April 2024 I flew the same route and the weather condition was identical to the flight on 22 April 2024. Once again, I had to divert to Beruas after Lintang. Forward visibility was between 4-5 nm along the coast.	
3, C V 0	In 24 Apr 2024 I was again programmed with another student on the same route. The same reather condition persisted with the requirement to divert to Beruas. Forward visibility was not again 4-5 nm	
4. C b P	on O2 Mei 2024 I flew route 2A, similar in nature to route 6A. At Pantai Remis the visibility egan to deteriorate to about 3nm of forward visibility and 1 was unable to proceed to Pulau angkor. The flight was discontinued and a 180-turn was made to rejoin for WMKI.	
Based on	my personal experience over this period of time I am of the expressed opinion that:	
a. 1 b. 1 c. 1 d. 1	his present weather pattern will persist for a few more weeks. I is perhaps unsafe to send XC solo flights under the present weather conditions. hat GPS be carried on board for all XC flights. Flight Instructors to continue to monitor the weather conditions and update the academy coordingly.	
Your sin	uuuul _{is} .	

APPENDIX F

CAAM CONFIRMATION: NO OFFICIAL APPLICATION FOR ASSIGNING AN INSTRUCTOR AS A SAFETY PILOT DURING STUDENT SOLO FLIGHTS

From:	The first state of the first f
Sent:	Thursday, 13 February, 2025 6:06 PM
To:	and diale and the second reserve
Cc:	y
Subject:	Re: CLARIFICATION ON LLFA'S SAFETY PILOT ASSIGNMENT
Dear Sir,	
I hope this email find	s you well.
Thank you for your e current Principal Ope submitted to CAAM I	mail. With regard to your question, after checking with C, the rations Inspector for LLFA, I can confirm that there has been no official application by LLFA for assigning an instructor as a 'Safety Pilot' during trainee pilot solo flights
due to unfavorable w	eather conditions.
Additionally, I have a confirmed that no su	Iso consulted with the previous Principal Operations Inspector for LLFA, C.,
Should there be any	further clarification or inquiry required, I shall remain at your kind disposal.
Thank you and Best	Regards,
"MALAYSIA MADA	NI**
"BERKHIDMAT UN	IUK NEGARA"
Elight Operations Div	rision
Flight Operations Div for Civil Aviation Aut Tel: +603-88714021	vision hority of Malaysia (CAAM)