AIRCRAFT SERIOUS INCIDENT FINAL REPORT

SI 09/22P

Air Accident Investigation Bureau (AAIB)

Ministry of Transport, Malaysia

Textron Aviation Cessna 172P, Registration 9M-GPB

at Kota Kinabalu International Airport, Sabah

on 14 December 2022

Air Accident Investigation Bureau
Ministry of Transport
No.26, Jalan Tun Hussein, Precinct 4
Federal Government Administrative Centre
62100 PUTRAJAYA
Phone: +603-8892 1072
Fax: +603-8888 0163
E-mail: AAIB@mot.gov.my
Website http://www.mot.gov.my/en

Issued on 8 September 2023
MOT(S).600-5/4/87

AIR ACCIDENT INVESTIGATION BUREAU (AAIB)
MALAYSIA

ACCIDENT REPORT NO.: SI 09/22

OPERATOR	**: LAYANG-LAYANG FLYING ACADEMY**
AIRCRAFT TYPE	**: TEXTRON AVIATION C172P**
NATIONALITY OF AIRCRAFT	**: MALAYSIA**
REGISTRATION	**: 9M-GPB**
PLACE OF OCCURRENCE	**: KOTA KINABALU INTERNATIONAL AIRPORT, SABAH**
DATE AND TIME	**: 14 DECEMBER 2022 AT 0750 LT**

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 UTC +8 hours.

INTRODUCTION

The Air Accident Investigation Bureau of Malaysia

The Air Accident Investigation Bureau (AAIB) is the air accident and serious incident investigation authority in Malaysia and is responsible 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 these investigations in accordance with Annex 13 to the Chicago Convention 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 investigations nor the reporting processes have been undertaken for that purpose.

In accordance with ICAO Annex 13 paragraph 4.1, notification of the serious incident was sent out on 17 December 2022 to the National Transport Safety Board (NTSB), United States of America as the State of Design and Manufacture. A copy of the Preliminary Report was subsequently submitted to the Civil Aviation Authority of Malaysia (CAAM), Malaysia Airport Sendirian Berhad (MASB), and the Aircraft Operator on 13 January 2023.

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

TABLE OF CONTENTS

LIST OF APPENDICES

ABBREVIATIONS

AAIB	Air Accident Investigation Bureau
AAP	Actual Aiming Point
AFRS	Airport Fire & Rescue Service
AFTO	Approved Flight Training Organisation
ATC	Air Traffic Controller
AOC	Air Operator Certificate
BKI	Kota Kinabalu International Airport (IATA code)
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
FDR	Flight Data Recorder
FI	Flight Instructor
ft	feet
FOD	Foreign Object Debris
FTO	Flight Training Organisation
hrs	hours
IAP	Initial Aiming Point
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
IR	Instrument Rating
KKIA	Kota Kinabalu International Airport
km	Kilometre
LT	Local Time
MAHB	Malaysia Airport Holding Berhad
MASB	Malaysia Airport Sendirian Berhad
mi	miles
MOR	Mandatory Occurrence Reporting
m	metre

PAPI	Precision Approach Path Indicator
Rwy	Runway
SP	Student Pilot
SPL	Student Pilot License
Twy	Taxiway
TAF	Terminal Aerodrome Forecast
WBKK	Kota Kinabalu International Airport (IATA code)

SYNOPSIS

A Textron Aviation C172P aircraft bearing registration 9M-GPB was making a third attempt to land at Kota Kinabalu International Airport, Sabah after the student pilot had two unsuccessful landings.

On final Runway 20, with the wind at 080 degrees at 5 knots, a clearance to land was issued by the Air Traffic Controller for 9M-GPB. Upon touching down, the aircraft bounced and tilted to the right and with the right-wing tip almost hitting the runway. Subsequently, the aircraft veered to the left of the runway and entered the grass area before it stops. The student pilot escaped with no injuries.

The Aircraft Operator submitted a Mandatory Occurrence Report (MOR) to the Civil Aviation Authority of Malaysia (CAAM), and Air Accident Investigation Bureau, Malaysia (AAIB) as notification of the occurrence, and an investigation team was dispatched the next day.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On 14 December 2022, a Student Pilot (SP) was authorised to perform a solo navigation cross-country flight to Kuala Penyu and back to Kota Kinabalu International Airport, Sabah (WBKK) on a Textron Aviation C172P aircraft bearing registration 9M-GPB. The weather was perfectly good, with wind reported at 080˚/5 knots, with no reported Terminal Aerodrome Forecast (TAF)[1]. The start-up, taxi, take-off, and navigation exercises were uneventful.

The SP took off at approximately 0628 LT, and it was a normal flight to Kuala Penyu and re-joining Kinabalu. During re-joining, the tower cleared SP to the west of Pulau Sulug and expected number 2 on final after company traffic which was the SP's flying instructor (FI) himself flying with another student pilot. The SP re-joined right-hand downwind since Runway 20 was in use and approached after company traffic made their touch-and-go with the intention of a full stop to land. Tower cleared SP to land, and the SP approached as normal.

According to the SP, during the first approach he maintained 2 whites and 2 reds on the Precision Approach Path Indicator (PAPI) and the speed for landing was 70-75 knots. Upon touching down, the aircraft bounced 2 times before the SP decided to go around and simultaneously notified the tower. The tower cleared SP to join right-hand downwind Runway 20 (Rwy 20) and maintain 1000 ft. On the second approach, the SP was cleared for number 1 and the company traffic number 2 since it's 4-5 miles from final. The approach speed was 70-75 knots, again, the aircraft bounced 2 times upon touching down and decided to go around for the second time. The tower cleared SP to join righthand downwind Rwy 20 and maintain 1000 ft. Eventually, on the SP's third circuit, the FI, who was flying on another aircraft, contacted the SP on the radio and asked what happened, the SP replied that the aircraft speed did not want to

[1] A Terminal Aerodrome Forecast (TAF) is a concise statement of the expected meteorological conditions at an airport during a specified period (usually 24 hours).

washdown, and the FI advised the SP to calm himself down and to use the whole runway for landing.

During the final attempt, speed was maintained at 60-65 knots, and the approach was below the glide slope with four reds on the PAPI since students had been told to aim for the threshold during touchdown. This will allow the students to vacate via Taxiway Alpha (Twy A) as soon as possible in order to give space for the airliners to take off and land.

As soon as the aircraft touched down, the SP felt a little bit of bounce which made him decide to go around again, but the wing started to tilt to the right and almost hit the ground, consequently, the go-around was aborted. The SP attempted to control the aircraft to his best but to no avail. The aircraft skidded until it veered to the left of the runway and entered the grass area between Twy E & F. The SP pulled the control column backward and applied a full brake to stop the aircraft. After the aircraft had completely stopped, the SP informed the Air Traffic Controller (ATC) of his situation, declared a Mayday call, and proceeded to secure and shut down the aircraft.

When the ATC received the Mayday call, the ‘Crash Alarm’ was pushed to alert the Airport Fire Rescue Service (AFRS). The AFRS rushed to the position of the aircraft and assisted in the opening of the aircraft door to evacuate the SP who came across some difficulties evacuating himself. The SP did not suffer any injuries and the aircraft sustained some physical damage.

After the condition had been declared safe, the aircraft was removed from the area by the operator’s personnel and securely kept in their hangar. The rwy was declared safe to resume normal operations after a rwy inspection was carried out by the airport authority.

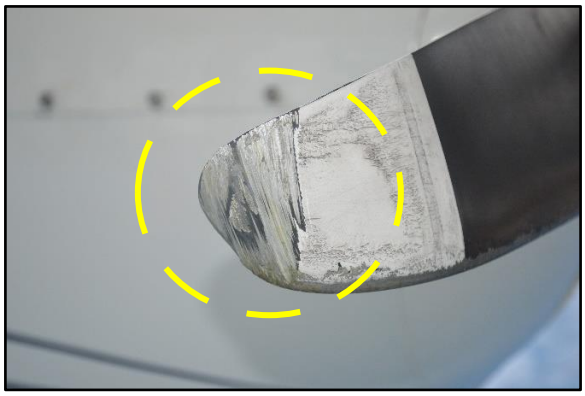
1.2 Injuries to Persons

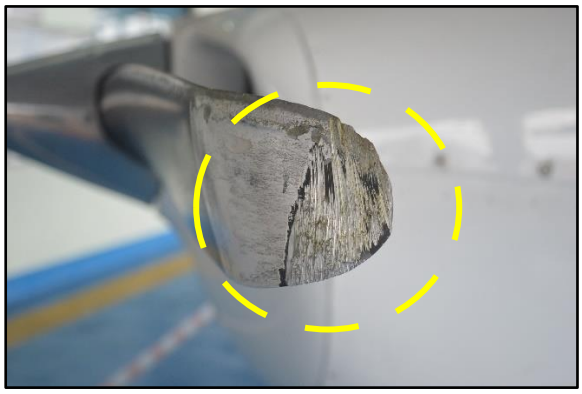
Injuries	Crew	Passengers	Others	Total
Fatal	NIL	NIL	NIL	NIL
Serious	NIL	NIL	NIL	NIL
Minor/None	01	NIL	NIL	NIL

1.3 Damage to Aircraft

A general visual inspection was carried out to assess and identify the damage to the aircraft after the occurrence. Damage was found on both propeller tips, with scratches and bent on both sides white area of the propeller as can be seen in the pictures below. The initial damage assessment report is as per **Appendix A.**

Figure 1: Bent on both sides white area of the propeller





Figures 2 and 3: Scratches on both propeller tips

At the time this final report was made, a detailed damage assessment report had not yet been obtained from the operator.

1.4 Other Damage

There's no other damage sustained by any objects other than the aircraft.

1.5 Personnel Information

15.1 Pilot

Status	Student Pilot
Nationality	Malaysian
Age	22 years old
Gender	Male
License Type	SPL (14080)
License Validity	Valid until 30 September 2023
Aircraft Rating	Cessna 172P
Total Hours on Type	74hrs

Total Flying Hours	74hrs
Rest Period Since Last Flight	24hrs
Medical Expiry Date	SPL for CPL / 13 September 2023

The SP was licensed, qualified, and approved to perform the flight in accordance with existing regulations**.** The SP was medically fit and adequately rested to operate the flight.

1.6 Aircraft Information

Aircraft Type	Textron Aviation Cessna 172P
Manufacturer	Textron Aviation
Year of Manufacturer	1981
Owner	Layang-Layang Flying Academy
Registration No.	9M-GPB
Aircraft Serial No.	172-74281
C of A Expiry Date	04 August 2023
C of R Expiry Date	17 July 2023

The aircraft was airworthy when dispatched for the flight. It has a valid registration and Certificate of Airworthiness (C of A), and has been maintained in compliance with the regulations. The maintenance records indicated that the aircraft is equipped, and maintained in accordance with existing regulations and approved procedures. The Aircraft Journey Log**,** Base Maintenance Release and Certificate of Insurance was submitted for examination to the investigation team

1.6.1 Aircraft Door

Based on the statement obtained from the SP, the SP was unable to open the aircraft door from the inside to evacuate himself after the aircraft had come to a complete stop because the door was stuck. The SP needs to be assisted by the AFRS personnel to open the door from the outside in order to evacuate from the aircraft.

In relation to that, when the investigation team did a general visual inspection of the aircraft, it was found that the port side door of the aircraft (the side where the SP was seated) was not aligned to its door frame where it should be.

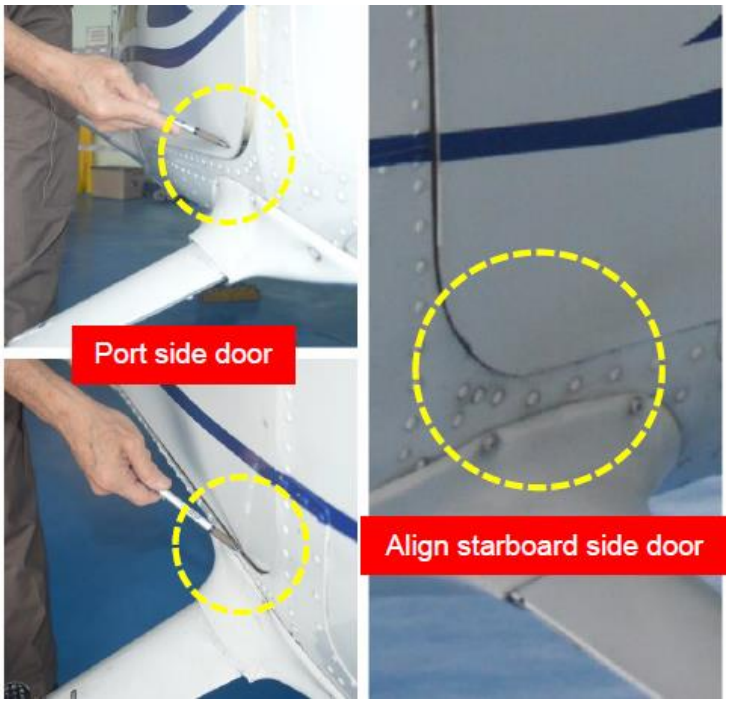


Figure 4: Port side door not aligned to its door frame

Figure 4 above shows the port side door is not aligned to its door frame compared to the starboard side door where it is aligned with its door frame. When the SP was asked, all this while when flying the aircraft how this door opened from the inside, the SP stated that the door had to be opened from the outside by putting the hand out of the window and pulling the door latch from the outside. The condition of the door might have contributed to the difficulties for the SP in opening the door to evacuate from the aircraft. From observation, this condition poses a potential safety hazard to the aircraft occupants in the event of smoke or fire to the aircraft or any emergency situations.

1.7 Meteorological Information

The weather forecasted by the Malaysian Meteorological Department for 0730 LT was fine weather with visibility of more than 10 km. There were few clouds at an altitude of 1,500 ft. Nevertheless, the weather conditions on that day did not contribute to the occurrence of the event.

1.8 Aids to Navigation

SP used the Precision Approach Path Indicator (PAPI) Lights to guide his landing. All other navigation aids were operating normally.

1.9 Communications

All ATC communication frequencies were operating normally. The 'Crash Alarm' was activated by the ATC on duty as soon as the Mayday call was received.

1.10 Aerodrome Information

Kota Kinabalu International Airport (KKIA) (IATA: BKI, ICAO: WBKK) is an international airport situated in Kota Kinabalu, the state capital of Sabah, Malaysia. It is located approximately 8 km (5.0 mi) southwest of the city centre and the coordinates on the map are 05˚56'41" N 11˚603'31" E. It has a single runway for its departures and arrivals: Runway 02 and Runway 20; with a length of approximately 3,788 m, and with an elevation of approximately 2 m.

Figure 5: Kota Kinabalu International Airport (KKIA) (Diagram not to scale)

1.10.1 Safety Observations of Runway Conditions

While in Kota Kinabalu, the investigation team was informed that Rwy 02 is currently closed for use, and only Rwy 20 is used for take-offs and landings. This is due to the poor and unsafe condition of Rwy 02, where the top layer of asphalt has been cracked, fractioned, and peeled off from its surface which created potholes on some parts of the runway. In relation to that, NOTAM has been issued to all flight operators to inform them of the closure of Rwy 02.

To ascertain the information, the investigation team went to see for themselves the condition of the runway, and some pictures were taken from the observation.

Figure 6: Peeled-off runway surface from temporary patchwork

Figure 7: New big patch was applied but the joint at the side between the new and old started to dislodge gradually

Figure 8: Debris collected after a few days of collection behind the MASB vehicle used for the runway inspection.

Several airline operators have submitted reports on the runway condition and the airport operator had come out with a Safety Assessment Report. There are actions taken like patch-up work, increased foreign object debris (FOD) sweep & standby repair team for repair at night. The airport operator also recommends Rwy 20 to be used for take-offs and landings. The Civil Aviation Authority of Malaysia (CAAM) came out with a NOTAM on this.

In summary, there is a serious safety concern about the loose debris on the runway. An international airport cannot be operating with these safety hazards. CAAM as the aerodrome regulator on safety matters should ensure the standard of repair work on the rwy by the aerodrome operator or meets the international requirement to ensure the safety of all aircraft when using the rwy.

1.11 Flight Recorders

The aircraft is not equipped with a Flight Data Recorder (FDR) or a Cockpit Voice Recorder (CVR).

1.12 Wreckage and Impact Information

Figure 9 below provides a general description of the site, the final portion of the flight path, the touch-down area, the impact sequence, and the location of impact impressions on the ground. The ‘red arrow’ indicates the last flight path prior to touch-down, the ‘yellow X’ is the touch-down point, the ‘blue arrow’ illustrates the aircraft rolling sequence, and the ‘black aircraft’ shows the location of the last aircraft position after it stops; between taxiway E and F.

Figure 9: 9M-GPB general description map of the incident
(Diagram not to scale)

1.13 Medical and Pathological Information

The SP underwent a urine drug screening and the results were negative for substance abuse. The SP's blood alcohol screening result was also within the normal limits.

1.14 Fire

There was no evidence of fire inflight or after the impact.

1.15 Survival Aspects

As soon as the Mayday call was received, the 'Crash Alarm' was immediately activated by the ATC personnel on duty to alert the AFRS team. The AFRS team then responded immediately and rushed to the site, they arrived at the location which is not far from their station approximately 1 minute.

Upon arriving at the site, the AFRS personnel found that there was no sign of fire and promptly performed a walk-around of the area in order to ensure the condition was safe. While performing the walk-around, one of the AFRS personnel saw the SP inside the aircraft and he indicated to the SP if he is ok or not. The SP replied with a thumbs

up indicating that he is ok and subsequently pointing to the aircraft door which he had difficulties opening from the inside.

After ensuring the surrounding conditions were safe, the AFRS personnel approached the aircraft and opened the aircraft door and talked to the SP, calmed him down, and eventually, the SP evacuated himself from the aircraft with the AFRS team's assistance and proceeded to a safe area away from the aircraft. No injuries were sustained in the evacuation.

In due course, the aircraft was removed by the aircraft operator from its last position. The removal was carried out without informing the investigation authority. Photos were taken during the process of removing the aircraft; however, photos of ground evidence markings and other perishable evidence were not taken to be given to investigators upon their arrival at the site.

1.16 Tests and Research

Not applicable.

1.17 Organisational and Management Information

1.17.1 Aircraft Operator

The Aircraft Operator is an Approved Flight Training Organisation (AFTO) by CAAM for pilot training since the year 2014 and is situated at Terminal 2, Kota Kinabalu International Airport, Sabah. It operates 3 types of aircraft, namely 7 x single-engine Textron Aviation C172, 2 x single-engine Piper 28, and 3 x twin-engine Piper 34; 3 types of helicopters, 2 x Robinson R44, 3 x Bell B206, and 1 x Eurocopter AS355. The main flying course conducted by the Aircraft Operator is the Integrated Course of Commercial Pilot Licence (CPL) / Instrument Rating CPL/IR (A) and helicopter training for Commercial Pilot Licence (CPL) / Instrument Rating CPL/IR(H).

1.17.2 Aerodrome Operator

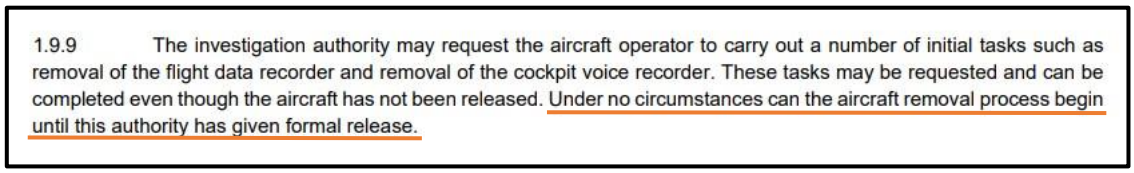
KKIA is operated by Malaysia Airport Sendirian Berhad (MASB), which is a subsidiary company of Malaysia Airport Holding Berhad (MAHB). MASB is licensed by the Ministry of Transport Malaysia to operate, manage, and maintain all airports in Malaysia except Kuala Lumpur International Airport (KLIA) and Senai International Airport.

Being an aerodrome operator certified under the Civil Aviation Regulations (Aerodrome Operations) 2016, it has to comply with any requirements as may be determined by the Director General. This includes ensuring all the staff are equipped with knowledge of the relevant documents used and what is contained in them in order to exercise the required standard practices, perform them accordingly, to coordinate and lead other agencies when required.

1.18 Additional Information

1.18.1 Removal of Aircraft

The aircraft was removed by the aircraft operator from its last position after the completion of all post-evacuation processes. The removal was done without the approval from AAIB. This completely contradicts what's written in the Airport Services Manual Part 5 – Removal of Disabled Aircraft (Doc 9137), paragraph 1.9.9 where it states "Under no circumstances can the aircraft removal process begin until the investigation authority has given formal release".



1.9.9 The investigation authority may request the aircraft operator to carry out a number of initial tasks such as removal of the flight data recorder and removal of the cockpit voice recorder. These tasks may be requested and can be completed even though the aircraft has not been released. Under no circumstances can the aircraft removal process begin until this authority has given formal release.

Figure 10: Airport Services Manual Part 5 – Removal of Disabled Aircraft (Doc 9137)

Photos were taken during the process of removing the aircraft; however, photos of ground evidence markings and other perishable evidence were not taken to be given

to investigators upon their arrival at the site. Therefore, the investigation team was unable to establish the last position of the aircraft and its path prior to vacating the runway and entering the grass area.

1.19 Useful or Effective Investigation Techniques

The investigation will be based on circumstantial evidence, witness accounts and statements, and the human factors analysis and classification system (HFACS) in order to establish the contributing factors as well as the probable cause of this event.

1.19.1 On-site Investigation and Witness Accounts

The aircraft is not fitted with FDR or a CVR. Thus, the on-site investigation was carried out to look for evidence that will assist in reconstructing the probable chain of events leading to this mishap. However, due to the lack of tangible evidence gathered during the on-site investigation, the investigating team had to depend on the SP's statements, witnesses' accounts as well as a mobile phone video footage received from a witness.

1.19.2 Reason's "Swiss Cheese" Model

The Reason "Swiss Cheese" Model (Figure 11) will be used to describe the layers of defences at which active failures/conditions and latent failures/conditions may occur in this event. Based on the evidence examined, it is determined that this mishap is Human Factor related.

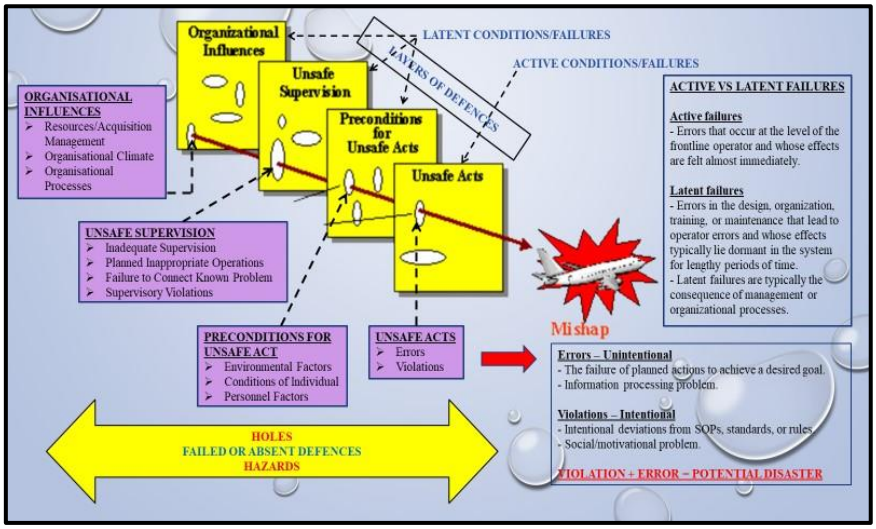


Figure 11: Reason's 'Swiss Cheese' Model Aviation

1.19.3 Human Factors Analysis and Classification System (HFACS)

Human Factors Analysis and Classification System (HFACS) will be used to evaluate and rule in or eliminate the various preconditions that resulted in the unsafe act based on the described layers of defences in the Swiss Cheese model at which active failures/conditions and latent failures/conditions may have occurred in this event. The supervisory and subsequent organisational difficulties that contributed to the prerequisite will then be evaluated. Finally, as shown in Figure 12, this will provide a complete human factors picture of all the events that led up to the mishap.

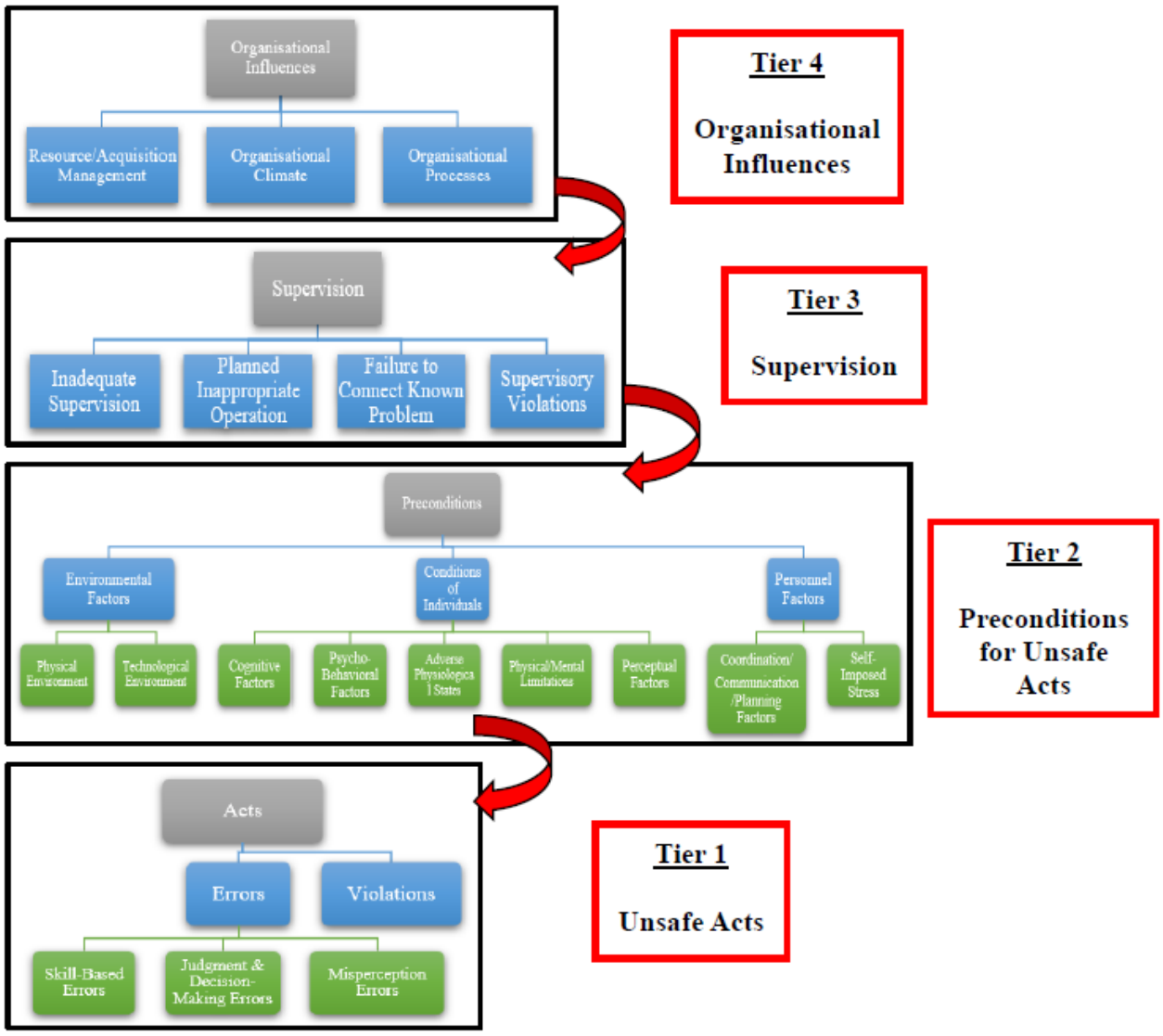


Figure 12: Human Factors Analysis and Classification System (HFACS) Model

2.0 ANALYSIS

2.1 On-site Investigation

In most occasions of aircraft veering off the runway, there's always on-site evidence of aircraft tyre track traces and impact marks, which are usually highly visible. These tyre track traces, impact marks, or absence thereof, will aid in supplying critical proof and information on what actually occurred.

Nevertheless, in this case, due to the lack of the above-said pieces of evidence, the SP's statement will be analysed and the sequence of events of the occurrence can be traced and recreated by using video footage obtained from a witness as described in Figure 13.

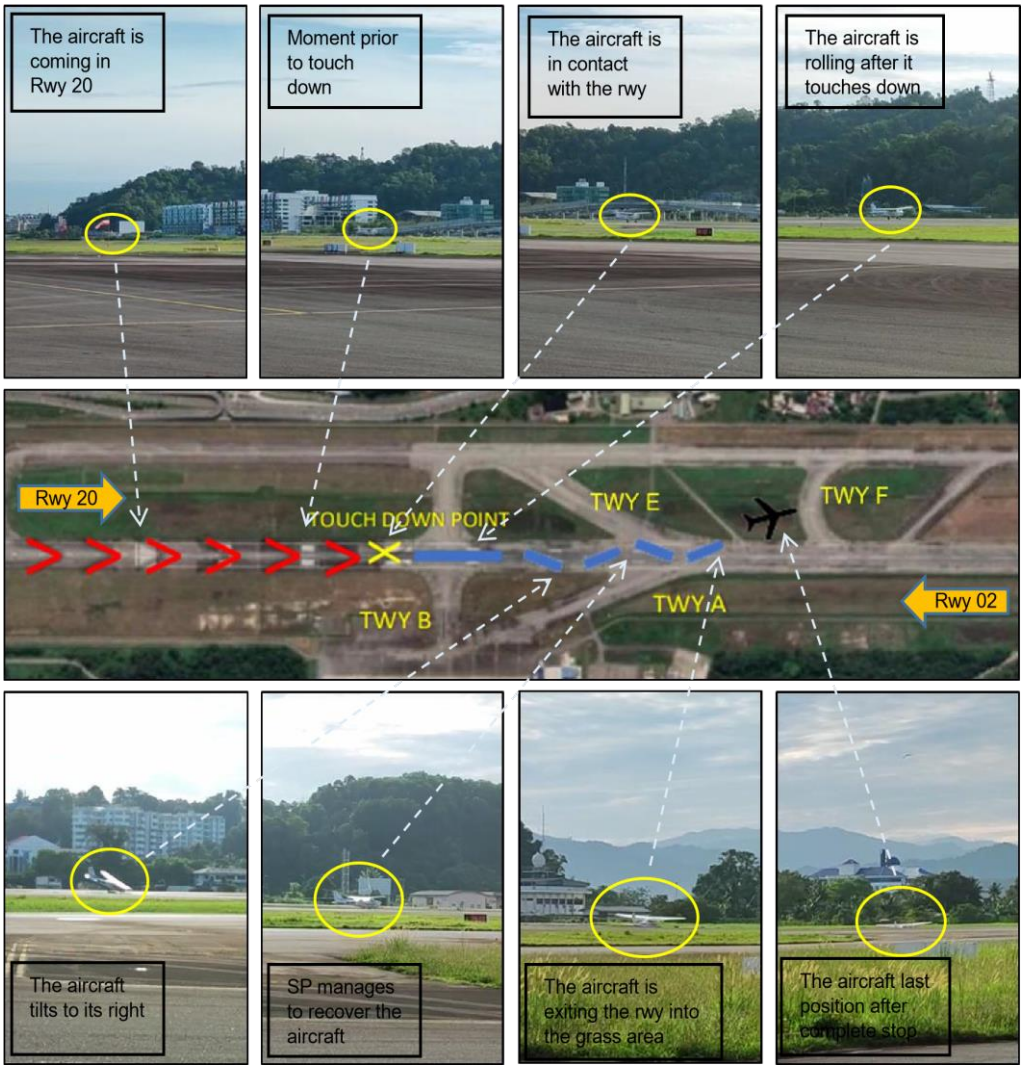


Figure 13: The sequence of the event obtained from a mobile phone video footage

2.2 SP's Statement and Video Footage Analysis

Based on the SP's statement during the interview, when he was coming for the first approach, the aircraft's speed was at 70-75 knots, with guidance assistance from the PAPI (2 whites and 2 reds) and he was aiming for the 1000-foot marker as the touchdown point. After passing the height of 500 ft, the SP then immediately changed aiming point to the threshold with the reason so that the SP could vacate fast via Twy A because it is nearer to their hangar. Subsequently, upon touching down, the aircraft bounced twice and the SP decided to go around.

During the second approach, the SP decided to land long and chose the 1000-foot marker as the touchdown point. Yet, when asked about the PAPI, the SP indicated that the aircraft was coming in with 3 whites and 1 red, and the SP was trying to reduce it to 2 whites and 2 reds. This suggests that the SP was coming in high for the approach. Again, during the landing attempt the aircraft bounced twice, and a go-around was commenced.

On the third landing attempt, the SP decides to land the aircraft and was aiming for the threshold. The approach speed was maintained at 60-65 knots, 4 reds on the PAPI, the aiming point was at the threshold, coming in with the crabbing technique - one wing low (crosswind from right), and eventually will vacate via Twy A. The SP stated that he landed the aircraft smoothly, but out of a sudden, the SP felt that the aircraft bounced a little bit. As a result of the two previously unsuccessful attempts, shackled by concern and anxious feelings, the SP decided to commence a go-around for the third time. After the bounce, the SP pitched the nose up and eventually, the aircraft tilted to the right, immediately the SP selected the power to idle and countered the aircraft to the left using the rudder in order to avoid it from toppling. Subsequently, the aircraft dropped onto the runway and went off the centreline, and the SP started to lose control of the aircraft and afterward veered off to the left of the runway into the grass area.

The sequence of the event for the final landing attempt had been obtained from video footage from a witness and it is depicted in Figure 13 above.

From the information collected during the interview as well as the video footage obtained, there are several factors which are distinct that have been identified that contributed to what happened. Apart from intangible factors such as the ground effect and crosswind, it is noticeable that the SP's judgment during the approach and the anxious feeling which affected the SP's performance plays a very significant role in this event.

As mentioned before, during the first approach, the SP was coming in with a speed of 70-75 knots and was aiming for the 1000-foot marker as the touchdown point. After passing the height of 500 ft, the aiming point immediately changed to the threshold in order to vacate via Twy A. Not realising, that this action had increased the aircraft's ground speed and explains why the speed of the aircraft didn't wash down prior to the touchdown. At the same time, the aircraft's rate of descent had increased significantly which led to the higher inertia and steeper angle of approach of the aircraft, hence, causing it to bounce after the first contact with the runway.

On the second approach, even though the SP had decided to land long and chose the 1000-foot marker as the touchdown point, the aircraft was still high with 3 whites and 1 red as indicated by the PAPI. With the effort to reduce to 2 whites and 2 reds at the last moment prior to touching down, the same effect had taken place whereby the aircraft's ground speed had increased and the angle of approach is steeper causing it to bounce again.

For the third and final attempt to land, based on the SP's statement, the SP decides to land the aircraft and was aiming for the threshold. The approach speed was maintained at 60-65 knots, 4 reds on the PAPI, the aiming point was at the threshold, coming in with the crabbing technique – one wing low (crosswind from right), and eventually will vacate via Twy A. However, as soon as the aircraft touched the runway, the SP felt that the aircraft bounced a little bit and decided to commence another go-around which then led to the mishap. However, observation from the video footage obtained from a witness, the aircraft landed smoothly on the runway as the screeching sound from the landing gear can be heard from the video, rolled quite a distance before it tilted to the right, went off the centreline, and veered to the left of the runway into the grass area.

In a nutshell, the poor judgment and inconsistency in choosing a single aiming point for landing by the SP resulted in bounce landings. The SP's misperception, and inattention combined with anxiety and concern feelings had caused the SP to lose control of the aircraft and later veered off the centre line and entered the grass area to the left of the runway.

2.3 Human Factor Analysis

Human factor issues related to this accident were examined using the Reason's Swiss Cheese model and HFACS worksheet. From the HFACS worksheet, evidence statements will be provided for ratings of 2,3, and 4 as shown in paragraphs 2.3.1 to 2.3.4. The series of latent failures outlined in paragraph 2.2 that led to the unsafe acts that breached the safety barriers and ultimately caused the mishap will be revealed in paragraphs 2.3.1 to 2.3.4. Subsequently, an Investigation Analysis Summary is tabulated in paragraph 2.4.

2.3.1 Tier 1 – Unsafe Acts

AE	ERRORS	EVIDENCE
AE 1	**Skill-Based Errors**	
AE 1.4	**Over-Control/Under-Control.** Overcontrol/Under-control is a factor when an individual responds inappropriately to conditions by either over-controlling or under-controlling the aircraft/vehicle/system. The error may be a result of preconditions or a temporary failure of coordination	Over-controlling the angle of descent during the final phase of the approach increased the sink rate of the aircraft resulting in bounced landings.
AE 2	**Judgment & Decision-Making Errors**	
AE 2.6	**Decision-Making During Operation.** Decision-Making During Operation is a factor when the individual through faulty logic selects the wrong course of action in a time-constrained environment	1. Selecting the 100foot marker as the IAP for landing and later changing it to the threshold as the AAP.

		2. The wrong course of action was taken during the final landing to correct the situation. which led to the loss of directional control of the aircraft. 3. Must vacate via Twy A.
AE 3	**Misperception Errors**	
AE 3.1	**Error due to Misperception.** Error due to Misperception is a factor when an individual act or fails to act based on an illusion; misperception or disorientation state and this act or failure to act creates an unsafe situation.	Based on the misconception that the aircraft had bounced after hitting the runway, incorrect corrective action was taken by the SP to remedy the situation during the final landing.

Unsafe acts are those that are most closely tied to the mishap and can be described as active failures or actions committed that result in human error or unsafe situations. These active failures or actions are identified as Errors and Violations.

In this case, without realising, unsafe acts have persisted since the first landing attempt, when the SP initially chose the 1000-foot marker as the IAP and later changed it to the threshold as the AAP after crossing the height of 500 feet in order to vacate via Txy A. The change in the aiming point led to the overcontrolled manoeuvre of the aircraft by the SP resulting in a high angle of descent, steeper sinking rate, and increased the aircraft's speed during the last part of the approach. This explains the SP's comment during the interview, in which the SP indicated that "the aircraft's speed did not wash down."

On the second approach for landing, despite the fact that the SP decided to use up the whole runway and chose the 1000-foot marker as the aiming point, the aircraft was still coming in high, as shown by the PAPI, with 3 whites and 1 red. A similar phenomenon had occurred when the aircraft's ground speed rose and the angle of approach became steeper, forcing it to bounce again.
On the third and final landing attempt, The SP perceived some bouncing as soon as the aircraft contacted the ground and opted to commence another go-around. Due to

the perception, the SP tried to fix the situation by performing corrective actions and unfortunately, the aircraft lost its directional control and hence veered off to the left of the runway. This was due to the SP failing to recognise what was happening when the aircraft actually did not bounce, but because the SP's perception was still influenced by the previous two bouncing events, the SP perceives that the aircraft had bounced and takes corrective action for the bounce landing rather than continuing with the normal landing roll process.

The misconception that the aircraft had bounced after hitting the runway, with incorrect corrective action made by the SP to remedy the situation during the landing had caused the aircraft to lose its directional control, tilt to its right, veer off the runway centreline, and exit to the left of the runway.

2.3.2 Tier 2 – Preconditions for Unsafe Acts

PC	CONDITIONS OF INDIVIDUAL	EVIDENCE
PC 1	**Cognitive Factors**	
PC 1.1	**Inattention.** Inattention is a factor when the individual has a state of reduced conscious attention due to a sense of security, self-confidence, boredom, or a perceived absence of threat from the environment which degrades crew performance. (This may often be a result of highly repetitive tasks. Lack of a state of alertness or readiness to process immediately available information)	1. Feeling anxious and concerned after 2 previous unsuccessful landing attempts. 2. Shackled by confusion due to not being able to identify what caused the aircraft to bounce. 3. Thoughts were influenced by the feeling "I just want to land the aircraft".

PC 5	Perceptual Factors	
PC 5.8	**Spatial Disorientation (Type 1) Unrecognised.** Spatial Disorientation is a failure to correctly sense a position, motion, or attitude of the aircraft or of oneself within the fixed coordinate system provided by the surface of the earth and the gravitational vertical. Spatial **Disorientation (Type 1)**. Unrecognised is a factor when a person's cognitive awareness of one or more of the following varies from reality: attitude; position, velocity, direction of motion, or acceleration. Proper control inputs are not made because the need is unknown.	Failing to correctly sense a position, motion, or attitude of the aircraft upon contacting the runway affected SP's motor skill function resulting in performing improper corrective action to remedy the actual situation.

The breach in the precondition for the unsafe act defence layer is a combination of cognitive and perceptual factors which had contributed to the unsafe act as analysed in paragraph 2.3.2. After 2 previous unsuccessful landings, the SP stated that he had anxiety and concerned feelings lingering in his mind and this indicates that the SP was in a state of reduced conscious attention due to a sense of security and self-confidence, which degraded the SP's performance.

This cognitive factor is further escalated by the confusion that the SP had due to not being able to identify what caused the aircraft to bounce. During the interview, the SP did mention that "I just want to land the aircraft". This factor may have come from the repetitive tasks (several landings and go-arounds) that the SP had executed prior to the mishap.

During the final landing, as soon as the aircraft touched the runway, the SP perceived that the aircraft had a little bounce and decided to commence another go-around, not realising the fact that the aircraft had firmly touched the ground, and subsequently performed the necessary corrective action to fix the situation. The improper corrective action taken to remedy the actual situation was the main precondition for the unsafe act in this mishap.

2.3.3 Tier 3 – Unsafe Supervision

SI	INADEQUATE SUPERVISION	EVIDENCE
SI 3	**Local Training Issues/Programs.** Local Training Issues/Programs area factor when one-time or recurrent training programs, upgrade programs, transition programs, or any other local training is inadequate or unavailable (etc) and this creates an unsafe situation.	There's no provision in the organisation's training programs (procedure/manual) regarding selecting one aiming point for normal approach and landing operation.

Consistency in selecting an aiming point for a normal landing during approach is essential in a flight training organisation. This is to allow SPs to fix one aiming point and continue to focus on making their landing based on that one aiming point that has been selected. When one aiming point is fixed, it is a lot easier to manoeuvre and to focus on should there be any unexpected event taking place (aim small miss small).
In this case, it was found that there is nowhere stated in the organisation's training program (procedure/manual) with regard to the selection of one aiming point for the normal approach and landing procedure. It should be clearly stated in the procedure/manual the selection of one aiming point in order to achieve consistency in the training program for normal approach and landing, hence, creating a safer operation and situation.

2.3.4 Tier 4 – Organisational Influences

OP	ORGANISATIONAL PROCESS	EVIDENCE
OP 3	**Procedural Guidance/Publications.** Procedural Guidance/Publications is a factor when written direction, checklist, graphic depictions, tables, charts or other published guidance is inadequate, misleading, or inappropriate and this creates an unsafe situation.	Inadequacy in the written direction i.e. procedure/manual within the organisation will lead to insufficient instructional which creates an unsafe situation.

In the functioning and instruction of an organisation, proper and comprehensive procedural guidance/publication is required. It will provide clear instructions and proper advice for an organisation and its personnel, as well as the ability to mitigate and regulate any risky activities that could lead to dangerous circumstances.

The organisation must ensure that all procedural guidelines and publications have suitable and sufficient instructions and information to completely meet the needs of the organisation and its staff and further instil a safer working environment.

3.0 CONCLUSION

3.1 Findings

3.1.1 Pilot

a. The SP was qualified and approved to perform the flight in accordance with existing regulations.

b. SP was medically fit and adequately rested to operate the flight.

c. SP had difficulties evacuating himself from the aircraft.

d. Results for the urine drug panel screen test were negative for substance abuse and the blood alcohol screening test was within the limit.

e. The SP changed the aiming point for landing at the last phase of the approach.

f. The SP over-controlled the angle of descent during the final phase of the approach and increased the sink rate of the aircraft.

g. The SP was feeling anxious and concerned after 2 previous unsuccessful landing attempts.

h. The SP's misconception that the aircraft had bounced after hitting the runway during the final landing.

i. The SP had taken the wrong course of action during the final landing to remedy the situation.

3.1.2 Aircraft

a. The aircraft was airworthy when cleared for the flight.

b. The aircraft is certified, equipped, and maintained in accordance with existing regulations and approved procedures.

c. The aircraft has a valid C of A and has been maintained in compliance with the regulations.

d. The maintenance records indicated that the aircraft is equipped, and maintained in accordance with existing regulations and approved procedures.

e. The aircraft port side door is not aligned with its doorframe.

f. The aircraft was removed from the site without advising the investigation authority.

g. The aircraft's speed did not wash down prior to landing. vii) The aircraft had lost its directional control and went off the runway.

3.1.3 Aircraft Operator

a. The aircraft operator holds a valid Air Operator Certificate (AOC) to operate as a Flight Training Organisation (FTO).

b. The aircraft operator either overlooked or did not perform proper maintenance on the aircraft's port side door.

c. iii) The aircraft operator's operating manual does not cover procedures related to selecting a single aiming point during the normal approach and landing.

3.1.4 Aerodrome

a. Runway 02 is closed for take-offs and landings and only Runway 20 is in use.

b. Runway 02 top layer of asphalt has been cracked, fractioned, and peeled off from its surface which created potholes on some parts of the runway.

c. The aircraft was removed not according to the Aerodrome Disable Aircraft Removal Plan.

3.2 Immediate Safety Actions Proposed in Preliminary Report

3.2.1 Aircraft Operator

The aircraft operator shall look into the issue related to the aircraft's port side door in ensuring the safety of the aircraft's occupants.

3.2.2 Aerodrome Operator

The aerodrome operator shall formulate long-term and effective maintenance solutions to improve the poor condition of the runway.

3.2.3 CAAM

a. CAAM shall establish mechanisms to ensure effective monitoring of the safety level of runway conditions on all aerodromes.

b. CAAM is to ensure all aerodrome operators have formulated effective maintenance solutions to warrant the condition of the runway is safe to be used at all times.

3.3 Probable Cause/Contributing Factors

From the human factor analysis as shown in the summary of the HFACS worksheet in Figure 14 (see Appendix G for details), it has been determined that the primary causes for the mishap were attributed to:

a. 2 Unsafe Acts (Tier 1) as follows:
   i. 1 Judgment and Decision-Making Error.
   ii. 1 Misperception Error.

The secondary causes were attributed to:

b. 1 Unsafe Act (Tier 1) as follows:
   i. 1 Skilled-Based Errors.

c. 2 Preconditions of Unsafe Acts (Tier 2) as follows:
   i. 1 Cognitive Factors.
   ii. 1 Perceptual Factors.

d. 1 Unsafe Supervision (Tier 3) as follows:
   i. 1 Inadequate Supervision.

e. 1 Organisational Influences (Tier 4) as follows:
   i. 1 Organisational Process.

TIER 1 – UNSAFE ACTS - ERRORS		4	3	2	1
AE 1	Skill-Based Errors		1		5
AE 2	Judgment & Decision-Making Errors	1			5
AE 3	Misperception Error	1			
TIER 1 – UNSAFE ACTS - VIOLATIONS					
AV 1	Violations – Based on Risk Assessment				1
AV 2	Violations – Routine/Widespread				1
AV 3	Violations – Lack of Discipline				1
TIER 1 – UNSAFE ACTS SUB TOTAL		**2**	**1**	**0**	**13**
TIER 2 – PRECONDITIONS FOR UNSAFE ACTS – ENVIRONMENTAL FACTORS					
PE 1	Physical Environment				11
PE 2	Technology Environment				8
TIER 2 – PRECONDITIONS FOR UNSAFE ACTS – CONDITIONS OF INDIVIDUAL					
PC 1	Cognitive Factors		1		7
PC 2	Psycho-behavioural Factors				15
PC 3	Adverse Physiological State				16
PC 4	Physical/Mental Limitations				5
PC 5	Perceptual Factors		1		10
TIER 2 – PRECONDITIONS FOR UNSAFE ACTS – PERSONNEL FACTORS					
PP 1	Coordination/Communication/Planning Factors				12
PP 2	Self-Imposed Stress				6
TIER 2 – PRECONDITIONS FOR UNSAFE ACTS SUB TOTAL		**0**	**2**	**0**	**90**
TIER 3 – UNSAFE SUPERVISION					
SI	Inadequate Supervision		1		5
SP	Planned Inappropriate Operations				7
SF	Failure Correct Known Problem				2
SV	Supervisory Violations				4
TIER 3 – UNSAFE SUPERVISION SUB TOTAL		**0**	**1**	**0**	**18**
TIER 4 – ORGANISATIONAL INFLUENCES					
OR	Resource/Acquisition Management				9
OC	Organisational Climate				5
OP	Organisational Processes		1		5
TIER 4 – ORGANISATIONAL INFLUENCES SUB TOTAL		**0**	**1**	**0**	**19**
TOTAL UNSAFE ACTS		**2**	**5**	**0**	**140**

Figure 14: Summary of HFACS Worksheet

The primary probable cause was attributed to the error due to SP's misperception, subsequently, making an improper decision based on an improper judgment. Having the perception that the aircraft had bounced after hitting the runway, had led the SP to take improper corrective action to recover from the situation during the final landing. Should the actual problem be identified accordingly, the SP would have made the right corrective action based on what was actually happening to remedy the situation, and most likely this mishap could have been avoided.

The secondary cause was attributed to the over-control of the angle of descent during the final phase of the approach thus increasing the sink rate of the aircraft due to the last-minute change of aiming point for landing done by the SP in order to vacate via Twy A, which then led the aircraft to bounce during the landing attempts. Making last-minute changes from IAP to AAP instead of selecting a single aiming point for normal approaches and landings caused inconsistency in the landing process. This inconsistency comes as a result of the lack of information and procedures contained in the procedure manual or guidelines issued by the organisation.

4.0 SAFETY RECOMMENDATIONS

It is recommended that the:

4.1 Aircraft Operator

4.1.1 To fix and conduct a proper maintenance on the aircraft's port side door to ensure it is operationally functional and safe.

4.1.2 To review and incorporate in the Flight Training syllabus a single aiming point for normal approach and landing.

4.1.3 To review the organisation's Emergency Response Plan (ERP) on the removal of aircraft process in the case of an accident or serious incident.

4.2 Aerodrome Operator

4.2.1 To formulate long-term and effective maintenance solutions to improve the poor condition of the runway (proposed in the Preliminary Report).

4.2.2 To strictly adhere to the ADARP with regard to the removal of aircraft in the case of an accident or serious incident.

4.3 CAAM

4.3.1 To establish mechanisms to ensure effective monitoring of the safety level of runway conditions on all aerodromes (proposed in the Preliminary Report).

4.3.2 To ensure all aerodrome operators have formulated effective maintenance solutions to warrant the condition of the runway is safe to be used at all times (proposed in the Preliminary Report).

4.3.3 To monitor compliance of aircraft operators to the ERP and aerodrome operators to the ADARP concerning the removal of disabled aircraft.

5.0 APPENDICES

A	Initial Damage Assessment	H-1 to H-14
B	Weight and Balance Log	I-1 to -10

INVESTIGATOR IN-CHARGE
Air Accidents Investigation Bureau
Ministry of Transport Malaysia

APPENDIX A

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

Layang Layang Aerospace Sdn Bhd Part 145

Initial Aircraft's Damage Assessment

Incident and Aircraft Details

1.	Incident	:	PROPELLER DAMAGE DUE TO RUNWAY EXCURSION	1A.	Category	:	MANDATORY OCCURRENCE REPORT (MOR)
2.	Name of the Operator	:	LAYANG LAYANG FLYING ACADEMY		• AOC • Non-AOC		AIR OPERATOR - AFTO
3.	Aircraft OEM	:	TEXTRON AVIATION	4.	Aircraft serial number	:	172-74281
5.	Model	:	TEXTRON AVIATION 172P	6.	Registration Marks	:	9M-GPB
7.	Date of Incident	:	14-12-2022	8.	Time of Incident	:	7:55 AM
9.	Place of Incident	:	WBKK				

Form No.: LLA/F/229 Rev: 0

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

Initial Aircraft's Damage Assessment

A1. Information

Propeller Damage Due to Runway Excursion

Runway identifier and condition : RUNWAY 20 / DRY
Departure/Destination point of aircraft : WBKK / WBKK
Flight crew at controls of the aircraft : Student Pilot
Aircraft speed at first event : 70-75 knots
Aircraft vertical speed : 5-700 ft/fpm
Vertical profile at the time of occurrence : 2351 UTC
Visibility information : 9999
Actual altimeter setting : Q1010
Immediate correction : NIL (To be ascertain)
Any supporting details to the event / Narrative / Scenario of the event:

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

Initial Aircraft's Damage Assessment

Incident Details:

It was an authorised Navigation Solo flight for the trainee pilot. Start up, taxi, take off and navigation exercise were uneventful.

However, during the approach to land, the trainee pilot encountered difficulties to firmly touchdown on the runway and carried out two go-arounds prior to landing on the third attempt.

During the final attempt to land, aircraft started veering off to the left of the runway as soon as the main wheels were firmly on the runway as soon as the main wheels were firmly on the runway.

The trainee pilot attempted to control the aircraft to his best ability but to no avail.

The aircraft continued to skid and ended up being on the grass strip by the left hand side of the runway.

The trainee pilot then informed ATC and declared a Mayday call and proceeded to secure and shutdown the aircraft.

WBKK AFRS responded to the positionof the aircraft and assisted in the opening of the aircraft door. The trainee pilot is safe without any injuries but the aircraft sustained somephysical damage.

The root cause and contributing factors are under investigations and to be determine.

General Visual Inspection carried out to assess and identify the damage on the propeller after the incident.

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

Initial Aircraft's Damage Assessment

A2. Inspection Task Description as per General Visual Physical Inspection

Components	Condition on 9M-GPB	Action
Propeller	Damage on both propeller tip, with scratch and bent on both side white area of the propeller as can be seen until further inspection. Cause: Propeller ground strike	 

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

Initial Aircraft's Damage Assessment

Nose Landing Gear	NIL defect until further inspection.	
Engine Cowling	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

Components	Condition on 9M-GPB	Action
LH Wing	NIL defect until further inspection.	
RH Wing	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

LH Wing Strut	NIL defect until further inspection.	
RH Wing Strut	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

LH Landing Gear	NIL defect until further inspection.	
RH Landing Gear	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

LH Aileron	NIL defect until further inspection.	
RH Aileron	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

LH Flap	NIL defect until further inspection.	
RH Flap	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

Fuselage	NIL defect until further inspection.	
Vertical Stabilizer	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

Horizontal Stabilizer	NIL defect until further inspection.	
Rudder	NIL defect until further inspection.	

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

Initial Aircraft's Damage Assessment

LH Elevator	NIL defect until further inspection.	
RH Elevator	NIL defect until further inspection.	

Summary

Visual inspection has been carried out and found propeller damage on propeller tip with scratch and bent. Other zone found NIL defect until further detailed inspection carried out.

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

Initial Aircraft's Damage Assessment

ISSUED and PREPARED BY: -

NAME: GORDON POONG

TITLE: ENGINEERING MANAGER

DATE: 27-12-2022

APPENDIX B

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

WEIGHT AND BALANCE LOG OF REVISIONS

Aircraft Type : CESSNA 172P

Aircraft Reg. : 9M-GPB

Aircraft S/N : 172-74281

Items No.	Form No.	Form Rev. No.	Pages	Description	Applicability (*) Please crossed as applicable
1.	LLA/F/101	05	1 of 1	Weight and Balance Log of Revisions	*Applicable / ~~Not Applicable~~
2.	LLA/F/089	04	1-3 of 3	Aircraft Weighing Checklist	*Applicable / ~~Not Applicable~~
3.	LLA/F/090	05	1-3 of 3	Aircraft Weighing Record	*Applicable / ~~Not Applicable~~
4.	LLA/F/091	05	1-3 of 3	Weight and Centre of Gravity Schedule	*Applicable / ~~Not Applicable~~
5.	LLA/F/092	05	1-3 of 3	Weight and Balance Equipment List -Installed	*Applicable / ~~Not Applicable~~
6.	LLA/F/093	02	-	Weight and Balance Equipment List Optional	~~*Applicable~~ / Not Applicable
7.	LLA/F/094	02	-	Weight and Balance Equipment List – Radio	~~*Applicable~~ / Not Applicable
8.	LLA/F/218	00	1 of 1	Continuous History of Changes in Structure or Equipment Affecting Weight & Balance	*Applicable / ~~Not Applicable~~

I hereby certify that above mentioned documents have been prepared, certified and compiled as per LLA's Weight and Balance Manual (LLA/145/SOP/WB) dated **27 JULY 2020**, Revision: **3**

Name: GORDON POONG

Approval No.: LLA 34

Date: 29 SEPT 2020

Signature:

Form No: LLA/F/101-05

Page 1 of 1

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

AIRCRAFT WEIGHING CHECKLIST

Aircraft Type	: CESSNA 172P	Weighing Date	: 29 SEPT 2020
Aircraft Serial Number	: 172-74281	Weighing Location	: LLA HANGAR, IPOH
Aircraft Registration	: 9M-GPB	Weighing By	: GORDON POONG
Job Number	: LL/CAMO/GPB/004		

This checklist details the step by step weighing procedures and shall be completed when carrying out an aircraft weighing.

DESCRIPTION	(✓)
1. Preparation of Maintenance Manual	
1.1 Print out applicable Aircraft Maintenance Manual (AMM) AMM Ref: **08-00-00** Rev: **22**	✓
1.2 Brief weighing crew on the procedure of aircraft weighing as reflected on Aircraft Maintenance Manual (AMM)	✓
2. Preparation of Aircraft	
2.1. Check aircraft Basic Equipment as per Minimum Equipment List (MEL) and Flight Manual and enlist it in Equipment List.	✓
2.2. Defuel aircraft in accordance with Maintenance Manual. AMM Ref: **12-14-01** Rev: **22**	✓
2.3. Check aircraft and engine fluid level in accordance with the Maintenance Manual. AMM Ref: **12-10-00** Rev: **22**	✓
2.4. Remove existing ballast in accordance with Maintenance Manual (if applicable). AMM Ref: **N/A** Rev: **N/A**	✓
2.5 Aircraft properly loaded and configure in accordance with the Flight Manual. FM Ref: **SECTION 6** Rev: **05**	✓
3. Preparation of Weighing Equipment	
3.1. Check the date of the last calibration of weighing equipment and ensure it is not expired. Date recorded for Weighing Scales: **18 JUNE 2020** Date recorded for Special Equipment: **N/A**	✓
3.2. Refer setup instructions as per Wireless Weighing Instruction for JACKSON Aircraft M2400 Wireless Laptop Scale System operation, Page 19, Rev 2018.	✓

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

DESCRIPTION	(✓)
4. Preparation for Aircraft Weighing	
4.1. Check serviceability of the aircraft weighing equipment and prepare in accordance with the Maintenance Manual.	✓
4.2. Ensure minimum manpower (4 crews) is available before commencement of weighing activity.	✓
4.3. Check to ensure that the cables of the weighing equipment are not coiled or crossed each other.	✓

RELEASE STATEMENT

Signature : Coled Approval No : LLA 34

Name : GORDON POONG

Date : 29 SEPT 2020

"Certified that the work specified above as otherwise specified, was carried out in accordance with the CAR 2016 and in respect to that work the aircraft/equipment in condition for safe operation and considered ready for release to service"

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

DESCRIPTION	(✓)

5. Computation of Readings

5.1	Calculate Ballast Loading and install required ballast weight on the aircraft in accordance with the Maintenance Manual (if applicable).	✓
5.2	Prepare Aircraft Weighing Record Form Refer Aircraft Weighing Record No. **LLA /WR/20-033**	✓
5.3	Prepare Weight and Centre of Gravity Schedule Form Refer Schedule Ref. No. **LLA /WS/20-033**	✓
5.4	Prepare Weight and Balance Equipment List – **Form LLA/F/092-05**	✓

COMPUTATION OF READINGS

Computation has been carried out and prepared by under signee, and it is at best of his knowledge that it is correct and the CG Location is within permissible envelope for safe operation.

Signature : Gold Approval No.: LLA 34

Name : GORDON POONG Date : 29 SEPT 2020

Form No: LLA/F/089-04

Page 3 of 3

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

AIRCRAFT WEIGHING RECORD

REFERENCE NO.	**LLA/WR/20-033**
AIRCRAFT REGSTRATION	**9M-GPB**
AIRCRAFT TYPE	**CESSNA 172P**
AIRCRAFT SERIAL NO.	**172-74281**
PROPERTY OF	**LAYANG LAYANG FLYING ACADEMY**
WEIGHING LOCATION	**LLA HANGAR, IPOH**
WEIGHING DATE	**29 SEPTEMBER 2020**
WEIGHING REASON	**CHANGE OF OWNER/OPERATOR**
WEIGHING EQUIPMENT	**JACKSON AIRCRAFT M2400 WIRELESS LAPTOP SCALE SYSTEM**
WEIGHING EQUIPMENT CALIBRATION DUE DATE	**18 JUNE 2020**

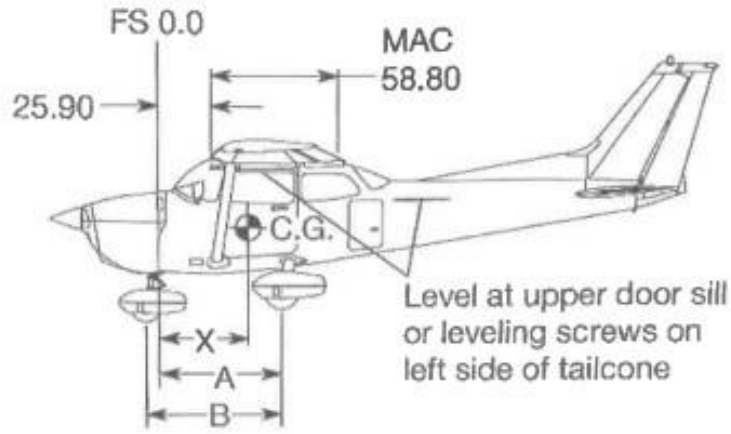
BASIC WEIGHT	**1 545.00 lb**
C.G. FROM DATUM LINE	**41.14 in**
LATERAL C.G.	-

Form No.: LLA/F/090-05

Page 1 of 3

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

AIRCRAFT WEIGHING RECORD



Reaction (Wheels)	Average Scale Reading (lb)	Longitudinal		Lateral	
		Arm (in)	Moment (lb.in)	Arm (in)	Moment (lb.in)
Left Hand (LHD)	559.00	58.20	32 533.80	-	-
Right Hand (RHD)	568.00	58.20	33 057.60	-	-
Nose (FWD)	401.00	-6.80	-2 726.80	-	-
TOTAL (as weighed)	**1 528.00**	**41.14**	**62 864.60**	-	-

Items included as aircraft weighed: -

1. Engine oil, brake fluid serviced to normal flight condition.
2. Basic equipment as per Equipment List.
3. First Aid Kit - 1 Unit
4. Headsets - 2 Units
5. Aircraft Documents

Remark: -

1. Aircraft weighing performed inside hangar
2. Fuel tanks drained (Aircraft straight and levelled)
3. Refer to Flight Manual **SECTION 6, Page 6-14** for Operating Weight C of G Chart.
4. Levelling Provision: Level at upper door sill or levelling screws on the left side of tailcone.
5. Nose wheel to datum is -6.80'
6. Main Wheel to datum is 58.20'
7. Datum is referred to is the one defined in the Flight Manual which is located at station 0.0 situated at the forward face, lower portion of the engine firewall.

Form No.: LLA/F/090-05

Page 2 of 3

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

AIRCRAFT WEIGHING RECORD

COLUMN I

Items Weighed but Not Part of Basic Weight	Weight (lb)	Longitudinal		Lateral	
		Arm (in)	Moment (lb.in)	Arm (lb)	Moment (lb.in)
Leveling Plate	1.00	125.00	125.00	-	-
TOTAL	**1.00**		**125.00**		-

COLUMN II

Basic items Not Included When Aircraft Weighed	Weight (lb)	Longitudinal		Lateral	
		Arm (in)	Moment (lb.in)	Arm (in)	Moment (lb.in)
Unusable Fuel (Drainable)	18.00	46.00	828.00	-	-
TOTAL	**18.00**		**828.00**		-

CORRECTED WEIGHT AND C.G. LOCATION

Description	Weight (lb)	Longitudinal		Lateral	
		Arm (in)	Moment (lb.in)	Arm (in)	Moment (lb.in)
TOTAL (as weighed)	1 528.00		62 864.60		-
MINUS-Column I	1.00		125.00		-
PLUS-Column II	18.00		828.00		-
TOTAL	1 545.00		63 567.60		-
CORRECTED BASIC WEIGHT	**1 545.00**	**41.14**	**63 567.60**	-	-

PERFORMED BY,
Signature/Approval Stamp — LLA 34
Name: GORDON POONG — Date: 29 SEPT 2020

CHECKED BY,
Signature/Approval Stamp — LLA 01
Name: JOHAN POONG ABDULLAH — Date: 29 SEPT 2020

APPROVED BY,
Signature
Name: JOHAN POONG ABDULLAH — Date: 29 SEPT 2020

Form No.: LLA/F/090-05

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

WEIGHT & CENTRE OF GRAVITY SCHEDULE

LOCATION: **LLA HANGAR, IPOH**	REFERENCE: **LLA / WS /20-033**
CONSTRUCTOR: **CESSNA AIRCRAFT COMPANY**	AIRCRAFT TYPE: **CESSNA 172P**
AIRCRAFT REGISTRATION No: **9M-GPB**	AIRCRAFT SERIAL No: **172-74281**
CENTRE OF GRAVITIY LIMITS: - Refer to Flight Manual Reference No: **SECTION 6**	Max. Authorized Weight: **2 400 lb**

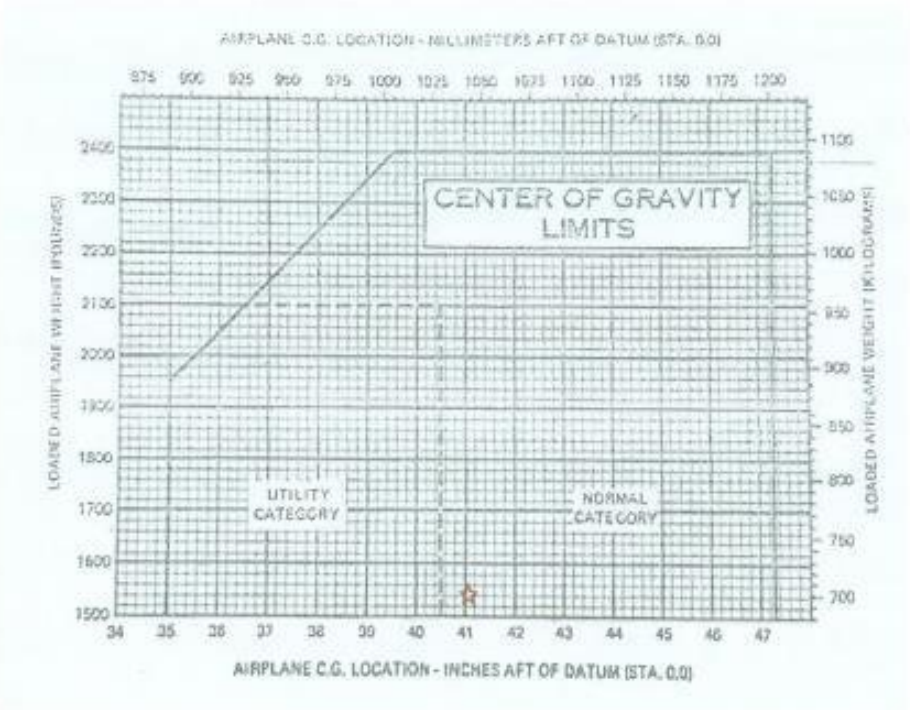
NOTE: - All level arms are distances in inches. Aft of datum reading (+) plus. Front of datum reading (-) minus.

PART A – BASIC WEIGHT

The basic weight of the aircraft calculated from Weighing Record: **LLA / WR /20-033** dated: **29 SEPT 2020** is **1 545.0 lb.**

The Centre of Gravity of the aircraft in the same condition at this weight is **41.14 in** aft of datum.

The total moment about the datum in this condition is : Longitudinal; **63 567.60 lb.in**
: Lateral; **N/A**



Note: (*) Please crossed as applicable.
Form No. LLA/F/091-05

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

PART A – BASIC WEIGHT

Note:

1. The Datum referred to is the one defined in the Flight Manual is fuselage station "0" situated forward front face, lower portion of the engine firewall.
2. The basic weight includes the weight of **unusable fuel and the weight of equipment as per Equipment List (Form LLA/F/092-05)**.
3. **Shall any changes of Part A-Basic Weight as per W & B Manual Part 2.7**, refer to Form LLA/F/218) - Continuous History of Changes in Structure or Equipment Affecting Weight & Balance for a Running Total Basic Aircraft Weight.

PART B – VARIABLE LOAD

The Weight and Lever Arms of the Variable are shown below. The variable load depends upon the equipment carried for the particular role.

Item	Weight (lb)	Longitudinal Lever Arm (in)	Lateral Lever Arm (in)
1. Pilot	Actual	37.00	-

PART C – LOADING INFORMATION (DISPOSABLE LOAD)

It is mandatory for the commander of the aircraft to satisfy himself before take – off that load carried is of such weight and is so distributed and secured that it may safety be carried on the intended flight. The information in this part includes the lever arms of the items of disposal load which could be carried on any flight.

Item	Weight (lb)	Longitudinal Lever Arm (in)	Lateral Lever Arm (in)
1. Passenger			
- Row #1	Actual	37.00	-
- Row #2	Actual	73.00	-
2. Baggage			
Maximum load:			
Compartment 1 : MAX 120 Lb	Actual	95.00	-
Compartment 2 : MAX 50 Lb	Actual	123.00	-
Combined Compartment : MAX 120 Lb			

Layang Layang Aerospace Sdn. Bhd. (243883-v

AIRCRAFT BASIC WEIGHT AND BALANCE RECORD

(CONTINOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT AND BALANCE)

AIRCRAFT TYPE	CESSNA 172P	SERIAL NUMBER	172-74281	REGISTRATION	9M-GPB	WEIGHT & CG SCHEDULE REF #	LLA/WS/20-033

DATE	DESCRIPTION OF ARCTICLE OR MODIFICATION		WEIGHT CHANGE ADDED (+) WEIGHT lb.	ADDED (+) ARM in.	ADDED (+) MOMENT lb.in	REMOVED (-) WEIGHT lb.	REMOVED (-) ARM in.	REMOVED (-) MOMENT lb.in	RUNNING TOTAL BASIC AIRCRAFT WEIGHT lb.	RUNNING TOTAL BASIC AIRCRAFT ARM in.	RUNNING TOTAL BASIC AIRCRAFT MOMENT lb.in	SIGNATURE LICENSE/ APPROVAL NUMBER	DATE
29/09/2020	BASIC EMPTY WEIGHT	LONG.	-	-	-	-	-	-	1 545.00	41.14	63 567.60	LLA 34	29/09/2020
		LAT.	-	-	-	-	-	-		-	-		
		LONG.											
		LAT.											
		LONG.											
		LAT.											
		LONG.											
		LAT.											
		LONG.											
		LAT.											

THE PERSON WHOSE SIGNATURE APPEARS IN THE EXTREME RIGHT-HAND COLUMN CERTIFIES THAT THE WORK RECORDED ABOVE HAS BEEN CARRIED OUT ACCORDINGLY AS PER WEIGHT & BALANCE MANUAL (PART 2.10 WEIGHING PROCEDURE) AND THE RESULT OF IT IS WITHIN THE CENTRE OF GRAVITY (CG) ENVELOPE.

Form No.: LLA/F/218-00

Page 1 of 1