Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

FINAL REPORT

RP-R5859
AGCAT G-164A

OPERATOR: DAVAO AEROWURKZ CORPORATION

TYPE OF OPERATION: AGRICULTURAL SPRAYING

DATE OF OCCURRENCE: MARCH 15, 2024

PLACE OF OCCURRENCE : BARANGAY TAGNANAN, MABINI, DAVAO DE ORO, PHILIPPINES

TABLE OF CONTENTS
(RP-R5859, AG CAT G-164A Final Report)

FOREWORD

This report was produced by the Aircraft Accident Investigation and Inquiry Board (AAIIB), Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Philippines.

The report is based upon the investigation carried out by the AAIIB in accordance with Annex 13 to the Convention on International Civil Aviation, Republic Act 9497 Section 42, and Philippine Civil Aviation Regulation Part 13.

Readers are advised that the AAIIB investigates for the sole purpose of enhancing aviation safety. Consequently, AAIIB reports are confined to matters of safety significance and may be misleading if used for any other purpose. It should be noted that the information in AAIIB reports and recommendations is provided to promote aviation safety, and in no case is it intended to imply blame or liability.

Furthermore, no part of the AAIIB report or reports relating to any accident or investigation shall be admitted as evidence or used in any suit or action for damages arising out of any matter mentioned in such report or reports.

FINAL REPORT

TITLE: Accident involving a G-164A agricultural type aircraft with Registry Number RP-R5859 that had a rejected take-off at Nova Vista Management and Development Aerodrome, Barangay Tagnanan, Mabini, Davao de Oro Philippines, on March 15, 2024/ 0700H local time

Notification of Occurrence to National Authority

The notification of accident to AAIIB CAAP was relayed by the Operator of the aircraft at 1000H on March 15, 2024.

Identification of the Investigation Authority

The Aircraft Accident Investigation and Inquiry Board (AAIIB), the mandated accident investigation organization within the Civil Aviation Authority of the Philippines (CAAP) as the state of Occurrence/Registry/ Operator conducted the investigation.

Organization of the Investigation

In accordance with provisions of Philippine Civil Aviation Regulation (PCAR) Part 13, an Investigator-In-Charge was appointed.

Authority Releasing the Report

The Final investigation report was released by Aircraft Accident Investigation and Inquiry Board (AAIIB) and published at the CAAP website on 8 January 2025.

Synopsis:

On March 15, 2024, at about 0700H local time, a G-164A agricultural type aircraft with Registry Number RP-R5859 sustained substantial damage following a rejected take-off at Nova Vista Management and Development Aerodrome, Barangay Tagnanan, Mabini, Davao de Oro, Philippines. The pilot of the aircraft operated by Davao Aerowurkz Corporation egressed safely from the aircraft. A visual meteorological condition (VMC) prevailed at the time of the accident. The cause of the occurrence was attributed to the Pilot's failure to maintain directional control of the aircraft following the rejected takeoff.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AAOC	:	Agricultural Aircraft Operator Certificate
AMO	:	Approved Maintenance Organization
CAAP	:	Civil Aviation Authority of the Philippines
GPS	:	Global Positioning System
ICAO	:	International Civil Aviation Organization
PTO	:	Permit to Operate
SA	:	Situational Awareness
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Condition

1. FACTUAL INFORMATION

Aircraft Registration No.	:	RP-R5859
Aircraft Type/Model	:	Agricultural Aircraft/Ag CAT G-164A
Operator	:	Davao Aerowurkz Corporation
Address of Operator	:	Old Airport Rd, Sasa, Davao City
Date/Time of Occurrence	:	15 March 2024/ 0700H/2300 UTC
Type of Operation	:	Agricultural Spraying
Phase of Operation	:	Take-Off
Place of Occurrence	:	Barangay Tagnanan, Mabini, Davao de Oro, Philippines
Type of Occurrence	:	Runway side excursion

1.1 History of Flight

On March 15, 2024, at about 0700H local time, an Allied Ag CAT Production, Inc. G-164A agricultural type aircraft with Registry Number RP-R5859 sustained substantial damage following a rejected take-off at Nova Vista Management and Development Aerodrome, Barangay Tagnanan, Mabini, Davao de Oro, Philippines. The pilot of the aircraft operated by Davao Aerowurkz Corporation egressed safely from the aircraft. A visual meteorological condition (VMC) prevailed at the time of the accident.

During the take-off roll of the first swatting operations for the day, the pilot noticed the engine losing its power. Accordingly, he immediately added power, however, he observed that the rpm did not increase. The pilot then decided to initiate a rejected take off by retarding the throttle to idle while maintaining runway heading. After the tailwheel touched the ground, the pilot applied brakes to stop the aircraft, however it started to swerve towards the left side of the runway. The pilot applied the right rudder to bring the aircraft back to the center, but it continued its direction. It made a ground loop and came to a full stop in an upright position after the right wing and

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

main landing gear hit an embankment. The aircraft's final resting point was located at 242 degrees, with grid coordinates of 7.244767N, 125.846502E (Figure 1).

Figure 1 - RP-R5859 on its final resting point.

1.2 Injuries to Person (s)

Injuries	Crew	Passengers	Others	TOTAL
Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	0

1.3 Damage to Aircraft

The aircraft sustained substantial damage.

1.4 Personnel Information

1.4.1 Pilot

Gender : Male
Date of Birth : July 11, 1993
Nationality : Filipino
License : CPL-105438

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

Valid up to	:	October 16, 2028
Type Rating	:	Airplane: Single Engine Land- AG CAT- G164A, C-150, C-172
Medical Certificate	:	Class 1 valid up to January 28, 2025
Time on A/C type	:	500+00 Hours
Grand Total Time	:	700+00 Hours

1.5 Aircraft Information

1.5.1 Aircraft Data

Registration Mark	:	RP-R5859
Manufacturer	:	Allied Ag Cat Productions, Inc.
Type/Model	:	AG CAT G-164A
Operator	:	Davao Aerowurkz Corporation
Serial No.	:	1006
Date of Manufacture	:	1975
Certificate of Airworthiness Valid up to	:	September 04, 2024
Certificate of Registration Valid up to	:	May 11, 2027

1.5.2 Engine Data

Manufacturer	:	Pratt & Whitney
Type/Model	:	R-985 AN-14B
Serial No.	:	42-122863
Engine Time Since New	:	8,454+38 Hours

1.5.3 Propeller Data

Manufacturer	:	Hamilton Standard
Serial Number	:	6054
Model	:	12D40-403
Propeller Time Since New	:	274+30 Hours

1.6 Meteorological Information

Visual Meteorological Conditions (VMC) prevailed at the time of the accident.

1.7 Aids to Navigation

The flight was carried out under Visual Flight Rules (VFR). Using VFR, the pilot must be able to operate the aircraft with visual references to the ground and visually avoid obstructions and other aircraft.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

1.8 Communications

Normal communications were carried out between the pilot and other aircraft operating in the area.

1.9 Aerodrome Information

1.9.1 General Information

A permit to operate (PTO) certificate number: AGA-P-009A-2013 dated March 07, 2013 was granted to Unifruitti Growers Services Inc. to operate Nova Vista Management and Development Aerodrome.

Aerodrome Name	:	Nova Vista Management and Development Aerodrome
Coordinates	:	7.1452.05N, 125.5038.29E
Aerodrome Operator	:	Unifrutti Growers Services Inc.
Runway Direction	:	14/32
Runway Length	:	900 m
Runway Width	:	15m
Surface	:	Compacted Macadam

1.10 Flight Recorders

The aircraft was not equipped with any flight recorders and existing CAAP regulation does not require it.

1.11 Wreckage and Impact Information

The aircraft made a ground loop and came to a full stop in an upright position after the right wing and right main landing gear hit an embankment. The aircraft's final resting point was located at 242 degrees with grid coordinates of 7.244767N, 125.846502E.

1.12 Medical and Pathological Information

There was no medical impediment that hindered the pilot's fitness to fly. His medical records also confirmed that he met the CAAP and ICAO Annex 1 Medical Standards for exercising the privileges of the license held.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

1.13 Fire

There was no post-crash fire observed during on-site investigation.

1.14 Search and Survival Aspects

Search was not conducted since the accident happened in the airstrip of the banana plantation. The crash was survivable because the integrity of the cockpit was not impaired. The seat and restraint remained intact after the accident.

1.15 Test and Research

Post accident site examination was conducted by accident investigators to the aircraft carburetor fuel filter and fuel bowl filter screen. The engine of RP-R4456 was also removed from the crash site on March 16, 2024, and brought to the Operator's hangar for further inspection

1.16 Organizational and Management Information

1.16.1 Operator

The aircraft, RP-R5859 was operated by Davao Aerowurkz Corporation, with an address of Gen. Aviation Group Area, Old Airport Rd, Sasa, Davao City. Davao Aerowurkz Corporation is a holder of Agricultural Aircraft Operator Certificate (AAOC) number 11-2010006 valid to operate up until September 29, 2027. It is authorized to perform restricted operations that provides agricultural aerial spraying services to the agricultural industries. Based on their Operations Specifications, RP-R5859 is included in the list of authorized aircraft for agricultural operations.

1.16.2 Maintenance Organization

The maintenance function of RP-R5859 is being undertaken by Aerowurkz Aviation, Approved Maintenance Organization (AMO) with a current Certificate number 104-11 with facility located at Gen. Aviation Area, Old Airport, Sasa, Davao City valid to operate until August 31, 2025.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

2. ANALYSIS

2.1 Aircraft's take-off roll

The investigation revealed that the pilot noticed the engine lose its power during the take-off roll. Immediately, power was added, however, he observed that the rpm did not increase. The pilot then decided to initiate a rejected takeoff by retarding the throttle to idle while maintaining runway heading. It appears that the pilot did not advance the throttle sufficiently to initiate takeoff power. Furthermore, applying additional power increases the ground distance required for the take-off roll. This being the case, after the pilot initiated the rejected take-off procedure, the distance to stop the aircraft safely within the remaining runway was reduced.

Checklists have been the foundation of pilot standardization and cockpit safety. However, if the pilot lacks commitment to their use, checklists hold no value. Without using the checklist at the appropriate times, the odds are on the side of error. Pilots who fail to take the checklist seriously become complacent, and the only thing they can rely on is memory. As an effective contribution to safe piloting, the pilot shall use the checklist to ensure all flight and engine controls are in the proper take-off position. He also has to evaluate the status of the aircraft and comprehend what he hears and see to have an understanding of the current situation. In this occurrence, the pilot's inability to detect important cues and failure to recognize the implications of those cues suggests a breakdown in situational awareness (SA).

The installed GPS on the aircraft was removed and downloaded. The downloaded data shows the highest recorded speed during the take-off roll was 76 mph. The aircraft started to decelerate after being 600 meters away from the initial take-off point at RWY 14 of the airstrip. It continued to move forward for another 216 meters and decelerate while maintaining its runway heading. This deceleration was caused by the pilot's decision to initiate a rejected takeoff. The application of brakes after the rejected takeoff is only possible after the tail wheel is on the ground. Judicious use of the rudder for tailwheel steering and brakes may be required to keep the airplane on the runway after the rejected take-off. However, the primary goal is not necessarily to stop the airplane at the shortest distance, but rather to maintain control of the airplane as it decelerates. The GPS data also show that the aircraft moved for another 57 meters as it decelerated and started to veer to the left. The aircraft then made a ground loop and came to its final position after hitting an embankment (Figure 2). The veering to the left was the result of the pilot's application of full brakes to stop the aircraft as it was nearing the end of the runway. The maximum application of brakes and the right pedal to bring the aircraft back to the center imposes severe side loads on the landing gear and imparts ground looping tendencies. To avoid these side stresses or a ground loop, the pilot has to bring the aircraft smoothly to a halt using all of the remaining runway without severe use of the brakes while veering.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

Figure 2: Aircraft's take-off path

2.2 Dumping of chemical load for swathing operation during rejected take-off

According to the pilot, he was not able to dump a chemical load for the swathing operation during the rejected takeoff. A review of the company training manual for Ag Cat pilots has procedures recommended by the aircraft manufacturer for the dump of chemical loads during engine inoperative after take-off. However, there is no explicit procedure to dump chemical loads during a rejected takeoff. Establishing and implementing such procedures could provide a platform for flight crews to make decisions that ensure flight safety. Interviews with other company pilots revealed that a rejected take-off procedure involved dumping chemical loads if they seemed necessary in the event of an engine failure during the take-off roll. Apparently, the failure to dump chemical loads contributed to the aircraft's controllability during rejected takeoff. It is recommended that the company develop emergency plans and procedures to address potential accidents or incidents during application operations.

2.3 Engine Teardown and Inspection

A post-accident site examination conducted by accident investigators of the aircraft carburetor fuel filter (Figure 3) and fuel bowl filter screen (Figure 4) revealed no foreign particulates.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

Figure 3 - RP-R5859 carburetor fuel filter.

Figure 4 - RP-R5859 fuel bowl filter.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

The engine of RP-R5859 was removed from the crash site on March 16, 2024, and brought to the operator's hangar for further inspection. During inspection, the cylinder heads, cylinder barrels, and cooling fins showed no signs of cracks. A cylinder compression test was also conducted for any leaks or cracks but showed negative findings (Figure 5). Inspection checks were further conducted on the spark plugs (Figure 6), including a spark check on both magnetos (Figure 7). The checks did not reveal mechanical malfunctions or anomalies that would have affected the aircraft's normal operation.

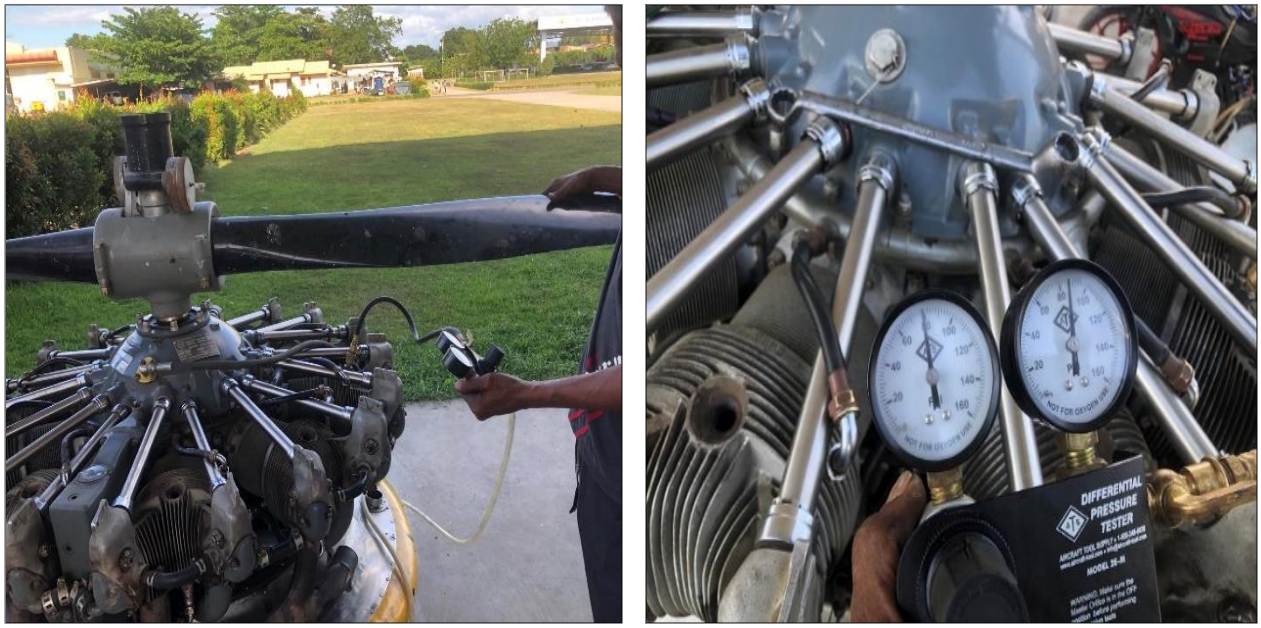

Figure 5 - Cylinder Compression Check

Figure 6 - Spark Plug Inspection.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

Figure 7 - Magneto Check.

3. CONCLUSIONS

3.1 Findings

a. The pilot has a valid license and medical certificate issued by the Licensing and Certification Department (LCD) and Office of Flight Surgeon and Aviation Medicine (OFSAM), CAAP, respectively.

b. A visual meteorological condition prevailed at the time of the accident.

c. The aircraft was released for flight without any discrepancies noted in its logbook.

d. The aircraft has a current aircraft registration and certificates of airworthiness.

e. The throttle was not advanced to takeoff power.

f. The aircraft made a ground loop and came to its final position after hitting an embankment.

g. The engine teardown and inspection did not reveal any mechanical malfunctions or anomalies that would have affected the aircraft's normal operation.

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph

3.2 Probable Cause

3.2.1 Primary Cause

a. The pilot failed to maintain directional control of the aircraft following the rejected takeoff.

3.2.2 Contributory Cause

a. Omission of the key steps in the take-off procedure checklist.

b. Absence of documented guidelines within the organization regarding the dumping of chemical loads during rejected takeoff.

c. Lack of situation awareness.

4. SAFETY RECOMMENDATION

4.1 As a result of the investigation, the AAIIB proposes the following safety recommendations to the CAAP-FSIS:

- To ensure that the Operator, Davao Aerowurkz Corporation:

a. Strictly impose the mandatory use of checklists on its pilots.

b. Reinforce pilots' training in situational awareness, and threat and error management.

c. Develop emergency plans and procedures to address potential accidents or incidents during application operations, such as the dumping of chemical loads during rejected takeoff.

d. Verify all procedures and processes implemented by the organization are fully documented and updated in the manuals.

-----END-----

MIA Road, Corner Ninoy Aquino Avenue, Pasay City, Philippines, 1300
+632 8246 4988 | opcen@caap.gov.ph | https://caap.gov.ph