



Republic of the Philippines  
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

## AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

### FINAL REPORT

RP-C6911  
HUGHES/MD369HS

---

***OPERATOR: PACIFIC SPOTTERS' CORPORATION***

***TYPE OF OPERATION: GENERAL AVIATION***

***DATE OF OCCURRENCE: AUGUST 16, 2022***

***PLACE OF OCCURRENCE: CLARK FREEPORT ZONE, ANGELES CITY,  
PAMPANGA, PHILIPPINES***

# TABLE OF CONTENTS

(Hughes/MD369HS, RP-C6911 Final Report)

Description	Page
Title Page	-----
Table of Contents	----- i
Foreword	----- ii
Synopsis	----- iii
List of Acronyms and Abbreviation	----- iv
1 Factual Information	----- 1
1.1 History of Flight	----- 1
1.2 Injuries to Person	----- 2
1.3 Damage to Aircraft	----- 3
1.4 Other Damages	----- 3
1.5 Personnel Information	----- 3
1.5.1 Pilot (P)	----- 3
1.5.2 AMT 1	----- 3
1.5.3 AMT 2	----- 3
1.6 Aircraft Information	----- 3
1.6.1 Aircraft Data	----- 4
1.6.2 Engine Data	----- 4
1.6.3 Rotor Data	----- 4
1.7 Meteorological Information	----- 5
1.8 Aids to Navigation	----- 5
1.9 Communications	----- 5
1.10 Aerodrome Information	----- 5
1.11 Flight Recorders	----- 5
1.12 Wreckage and Impact Information	----- 5
1.13 Medical & Pathological Information	----- 6
1.13.1 Pilot (P)	----- 6
1.13.2 AMT 1	----- 6
1.13.3 AMT 2	----- 6
1.14 Fire	----- 6
1.15 Search and Survival Aspects	----- 7
1.16 Test & Research	----- 7
1.17 Organizational and Management Information	----- 8
1.17.1 Operator	----- 8
2.0 Analysis	----- 8
2.1 General	----- 8
2.2 Maintenance Ground-Run Test procedures	----- 11
2.3 Intercom Link	----- 12
2.4 Collective Control Settings	----- 12
2.5 Cyclic Control Settings	----- 12
2.6 Pilot's Seat Restraint System	----- 12
2.7 Communications	----- 13
3.0 Conclusions	----- 13
3.1 Findings	----- 13
3.2 Probable Causes	----- 14
3.2.1 Primary Cause Factor	----- 14
4.0 Safety Recommendations	----- 14
4.1 As a result of the investigation	----- 14
Signatories	----- 14

## 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 Hughes, MD369HS type of aircraft with registry number RP-C6911 owned and operated by Pacific Spotters Corporation that had a Static Rollover at Clark Freeport Zone, Angeles City, Pampanga Philippines on August 16, 2022 at about 1056H (local).

### **Notification of Occurrence to National Authority**

The notification of accident to AAIIB CAAP was relayed by the Operator of the aircraft at 1230H (local) on August 16, 2022.

### **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 and Deputy Investigator-In Charge were 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 **7 August 2024**.

### **Synopsis:**

On August 16, 2022 at about 1056H, a Hughes, MD369HS type of aircraft with Registry Number RP-C6911 operated by Pacific Spotters Corporation had a static rollover occurrence at Clark Freeport Zone, Angeles City, Pampanga Philippines. The test pilot was fatally injured and the two (2) flight mechanics sustained serious physical injuries, however the aircraft was destroyed as a result of the accident. Visual Meteorological Condition (VMC) prevailed at the time of the accident. The cause of the occurrence was attributed to the test pilot failure to maintain ground control during maintenance ground run that resulted in a static rollover.

## **LIST OF ACRONYMS AND ABBREVIATIONS**

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AMO	:	Approved Maintenance Organization
AMOC	:	Approved Maintenance Organization Certificate
AMT	:	Aircraft Maintenance Technician
CAAP	:	Civil Aviation Authority of the Philippines
COA	:	Certificate of Airworthiness
CPL	:	Commercial Pilot License
COR	:	Certificate of Registration
EMT	:	Emergency Medical Team
FCU	:	Fuel Control Unit
FRU	:	Fire and Rescue Unit
HTC	:	Helicopter Technology Company
MR	:	Main Rotor
PIC	:	Pilot-In-Command
PS. Corp	:	Pacific Spotters Corporation
PSD-ICC	:	Public Safety Division-Integrated Command Center
TR	:	Tail Rotor
UTC	:	Universal Time Coordinated
VMC	:	Visual Meteorological Condition



## 1. FACTUAL INFORMATION

Aircraft Registration No. : RP-C6911

Aircraft Type/Model : Hughes / MD369HS

Operator : Pacific Spotters Corporation (P.S Corp)

Address of Operator : P.S Corp Compound, Buildings 7157 and N7166, C.M. Recto and Gil Puyat, Avenue, Clark Freeport Zone, Clark, Philippines.

Place of Occurrence : Clark Freeport Zone, Angeles City, Pampanga Philippines

Date/Time of Occurrence : August 16, 2022/ 1056H/0256 UTC

Type of Operation : General Aviation

Phase of Flight : Maintenance

Type of Occurrence : Helicopter dynamic roll-over

### 1.1 History of Flight

On August 16, 2022, aircraft Hughes (MD) 369HS, RP-C6911 (reserved marking) was on helipad inside the PS. Corp compound facing about 150deg (wind southwesterly below 10kts) undergoing maintenance ground-run checks/tests for Rotor Track & Balance respectively (no intent to fly) and on its 3<sup>RD</sup> day of ground-run (at full Rotor RPM this time).

The Pilot, seated at the left cockpit seat with assistance of two (2) Aircraft Maintenance Technicians (AMTs) positioned on the RH skid outside the aircraft were doing Rotor tracking & balancing tests. The right-side aircraft doors were open for communication thru shouts & signs.

When the pilot (not duly secured by seat restraint system) leaned towards the RH seat and viewed computer track/balance update data, the aircraft suddenly lifted-off to about 12 meters high. During the lift-off, AMT1 fell off at about 5ft high and AMT2 fell off at about 10ft high while the aircraft tilted to the right towards the rear. Then, the aircraft entered into a vertical nose-up (unusual) attitude with about 3 rotations on its longitudinal axis (tail down vertical) then dropped down and hit ground (tail first) at the vacant lot across the perimeter wall, North of the lift-off point at company compound. With the momentum of ground impact towards the

North, the right side of MR disc then hit the cemented ground (nose-oriented North) then finally the MR disc hit the cemented ground (fuselage was on right side down mode, nose heading about 060deg) as the last momentum to its final full-stop point about 15meters from initial (tail) impact point and about 40meters from the lift-off point at company compound. The aircraft at its final full-stop position settled on its RH side at about 70deg angle (from upright position) with nose oriented towards about 045deg. The aircraft was destroyed at its full stop impact point. There was no post-crash aircraft fire. The pilot's body was found on grass outside the aircraft wreckage next to the open right cockpit door.

The Site of the main wreckage was at Coordinates 15<sup>o</sup>,11',37.32" N 120<sup>o</sup>, 32',25.82" E, a distance about 40meters from the lift-off point at Coordinates 15<sup>o</sup>,11' 35.98" N, 120<sup>o</sup>, 32',25.89" E. Likewise, the site was about 345 meters from ATC tower of Clark Airport and oriented at 314deg. There was no reported collateral injury or damage to property.

While the maintenance activity had no intent to fly, with the prevailing unsafe acts and conditions, the aircraft was destroyed and the pilot on board was fatally injured. As a result, the occurrence is considered an accident for investigation and prevention purposes.



Figure 1. The aircraft at its final full-stop point.

## 1.2 Injuries to Person (s)

Injuries	Crew	Passengers	Others	TOTAL
Fatal	1 (Pilot)	0	0	1
Serious	1 (AMT 2)	0	0	1
Minor	1 (AMT 1)	0	0	1
None	0	0	0	0

### 1.3 Damage to Aircraft

The rotorcraft was destroyed.

### 1.4 Other Damages

There was no reported collateral injury and damage to property within the accident site.

### 1.5 Personnel Information

#### 1.5.1 Pilot-In-Command (PIC)

Gender	:	Male
Date of Birth	:	December 01, 1962
Nationality	:	Pilipino
License	:	107296 CPL valid up to June 30, 2024
Type rating	:	Rotorcraft- single and multi-engine land, AS355F2, AS350B/BA, B206B111, EC130B4
Medical Certificate Class I	:	Valid until September 30, 2022
ELP Level 4	:	Valid until 28 July 2021
Regulatory Pilot Proficiency Flight Check/Test	:	25 June 2019 for CPL Renewal. 1+00. Aircraft used AS-355-F2, RP-C2048. RPLL. (Latest on record at CAAP as of 24June2019)
Total Rotary time	:	6,400 Hours PIC

#### 1.5.2 Aircraft Maintenance Technician (AMT) 1

Gender	:	Male
Date of Birth	:	April 24, 1980
Nationality	:	Pilipino
License	:	012238-AMT
Rating	:	Airframe and Power-Plant

#### 1.5.3 Aircraft Maintenance Technician (AMT) 2

Gender	:	Male
Date of Birth	:	June 3, 1994
Nationality	:	Pilipino
License	:	127675-AMT
Type rating	:	Airframe and Power-Plant

### 1.6 Aircraft Information

The former Registry of the aircraft was N1DQ, SN 630491S, Manufacturer Hughes, year manufactured 1973, registered under Evan Air Inc., Vanuatu, Oceania. Its Registration was cancelled dated 20 July 2020 prior to De-Registration, with reason - for export to the Philippines.



When bought by PS. Corp in Vanuatu, its Engine was Allison, model 250 SER 400HP. Then it was transported into the Philippines for registration under RP Registry with a reserved Registry Marking of RP-C6911 and fitted with a Rolls Royce Engine and a new set of 4 Main Rotor blades, HTC, P/N 500P2100-301.

It was undergoing maintenance tests in preparation for Initial Issuance of Certificate of Airworthiness and will undergo type validation and conformity inspection as applicable prior to issuance of final Certificates of Airworthiness and Registration under CAAP.

### 1.6.1 Aircraft Data

Registration Mark	:	RP-C6911 (Reserved CAAP Registry Marking)
Manufacturer	:	Hughes MD Helicopters Inc.
Country of Manufacturer	:	USA
Type/Model	:	Hughes Helicopter/MD369HS
Owner Operator	:	Pacific. Spotters Corporation
AMO	:	Pacific. Spotters Corporation AMOC Nr. 162-17
Serial No./Type Certificate	:	630491S/TC H3WE
Date of Manufacture	:	1973
Certificate of Airworthiness	:	FAA COA No Expiration (No CAAP data yet)
Certificate of Registration	:	COR, No CAAP data. Under application (with reserved Marking RP-C6911)
Category	:	Normal, Rotary, Single Engine land
Number of Seats (Flight Crew)	:	1 pilot at left cockpit seat, 1 spotter at right cockpit seat (as needed only)
Airframe total time	:	15,146.4 Hours (at the time of accident)

### 1.6.2 Engine Data

The Allison Model 250, now known as the Rolls-Royce M250, (US military designations T63 and T703) is a highly successful turboshaft engine family. The Model 250 has been produced by Rolls-Royce since it acquired Allison in 1995.

Manufacturer	:	Rolls Royce
Type/Model	:	Turbo Shaft/250-C18ASeries
Engine Serial Number	:	AE403264
Engine Part Number	:	6856991
Time Since Overhaul	:	1,553 Hours
Time Since New	:	12,500 Hours

### 1.6.3 Rotor Data

The aircraft is equipped with a four-bladed Main Rotor. The 76EM8 composite rotor blades are designed for use on the Rolls-Royce 250-C18A Series engine.

Manufacturer	:	Helicopter Technology Company (HTC)
Type/Model	:	Composite/76EM855-0-62
Main Rotor Part Number	:	500P2100-301
Main Rotor Serial Number	:	C215, C216, B938, B939
Time Between Overhaul	:	2,000 hours



Date last Installed : August 11, 2022 (removed from RP-C6280)  
MRB Total Time Since New : 1,157.4 Hours (life limit 2440Hrs  
STC # SR09184RC, 1,283 hours remaining)

Note: Visual inspection was conducted on the rotor blades and engine rotor assembly for possible inconsistencies during its teardown inspection. There were indications of post-impact damage observed on the said parts.

## 1.7 Meteorological Information

Visual Meteorological Conditions (VMC) prevailed at the time of the occurrence with southwesterly wind at about 10kts (from the left).

## 1.8 Aids to Navigation

Aids to Navigation was not a factor on the occurrence.

## 1.9 Communications

The pilot conducted a pre-activity task briefing with the two AMTs in attendance. No intercom link existed between the pilot in the cockpit and the two AMTs on the right-side skid outside the aircraft doing the main rotor track and balance test. Shouts and signs were resorted to instead. The pilot was last observed overreaching to the right cockpit seat and viewing computer data on the rotor track and balance tests before the sudden lift-off occurred.

## 1.10 Aerodrome Information

Not Applicable.

## 1.11 Flight Recorders

The aircraft was not equipped with any flight recorders and existing Philippine Civil Aviation Regulation does not require it.

## 1.12 Wreckage and Impact Information

The aircraft, after the sudden lift-off to about 12 meters AGL and with a right bank, entered into a nose up/tail down unusual attitude with about (3X) rotation to the right on its longitudinal axis, then dropped down and hit ground (tail first). Then, it slid on ground on its right side, rotor hitting ground with northward momentum and finally settled on its right side. The aircraft was destroyed at its final full-stop position. Collective Friction was at low position as found on-site.





Figure 2: The aircraft was destroyed at the final full-stop point.

## 1.13 Medical and Pathological Information

**1.13.1 Pilot (Fatal Injury).** The pilot (Filipino) conducting the ground run was with the aircraft during the crash and was fatally injured.

Pathological autopsy report on the pilot showed:

- depressed Parietal Skull fx Z 5 to 6 cm laceration
- open frontal lobe c (+) brain tissues
- (+) OTTORRHEA
- (+) swelling on (L) upper shoulder
- possible fx at (R) elbow 3 to 4 cm laceration
- (+) swelling and abrasion on (R) oblique

**1.13.2 AMT 1 (Minor Injury).** Fell down from RH Skid at about 5 feet high during the sudden lift-off.

Hospital Medical report showed:

- abrasion on (L) hand,
- abrasion on (R) knee.

**1.13.3 AMT 2 (Serious Injury).** Fell down from RH Skid at about 10 feet high during the sudden lift-off.

Hospital Medical report showed:

- lower back pain, pain scale 6,
- Primary Diagnosis, Burst fracture L3.

## 1.14 Fire

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

## 1.15 Search and Survival Aspects

With the occurrence being within the aerodrome complex, local emergency responders were able to reach the site immediately.

Fire and Rescue Unit (FRU) arrived on-site about 7 minutes from impact (1103H) and found the main wreckage without post-crash fire. The Team found the pilot's body on grass outside the aircraft wreckage just below the open right cockpit door (but did not act on pilot's body or did not bring to nearest hospital) and the pilot's seat restraint system (seat belt & shoulder harness) still set and unused (pilot was not restrained on pilot seat during the lift-off and crash).

Likewise, the Emergency Medical Team (EMT) arrived on-site about 10 minutes from impact (1106H) but without a medical Doctor on board and did not act also on the pilot's body. Instead, the EMT picked up the two injured AMTs from the Company Compound and brought them to the nearest Hospital.

The Medical Doctor of the Aerodrome arrived on-site at about 44 minutes (1140H) from time of impact, did not facilitate the immediate transfer of the pilot to a hospital but rather assessed the pilot's body and declared it dead on-site after 5 minutes (1145H) or about 49 minutes from time of impact.



Figure 3. The right side of the main wreckage at the final impact point with the pilot's body.

## 1.16 Test and Research

- a. The engine of the aircraft was subjected to Teardown Inspection on September 05, 2022 at the company Approved Maintenance Organization (AMO) under close observation by AAIB-Investigators. Data included as follows: 1) The Fuel Control Unit indicated in idle position among others. 2) The Fuel Pump had no evidence of fuel contamination that could cause fuel starvation. The fuel filter was new and clean.

- b.** The pilot's cockpit instrument panel was not damaged and was intact in the instrument panel mount. The engine instruments such as the N1 tachometer instrument, N2 tachometer instrument, TOT, torque and oil pressure instruments indicated zero when the engine stopped after the impact.
- c.** The pilot controls were not damaged during the impact and indicated the following Settings after impact: Cyclic stick with half slack to the right, full slack rearward, locked (no slack) towards front and left. Collective stick was at low friction setting. Likewise, the pilot's Flight controls such as the collective, cyclic and pedals were not damaged during the impact.
- d.** The pilot's restraint system (seatbelt/shoulder harness) was not used and found still locked in place after impact.
- e.** The engine teardown examination as witnessed by CAAP-AAIIB investigators revealed no signs of other internal mechanical damage. The components of the engine compressor exhibited damage due to ingestion of few debris that hit the rotating spool during the accident.
- f.** The internal examination of the engine further showed that the components of the misaligned N1 coupling and the Power Turbine rotor assembly were indicating impact damage conditions.
- g.** There was evidence that the engine was delivering idle power at the time of impact as seen on the mechanical position of the fuel control unit (FCU) at idle position.

## **1.17 Organizational and Management Information**

### **1.17.1 Operator - Aircraft Maintenance Organization (AMO)**

- a.** The Aircraft Maintenance Activity for RP-C6911 was being undertaken by the Approved Maintenance Organization (AMO) with AMO Certificate No. 162-17 and with official address at Bldg. 7157 and N7166, C.M. Recto and Gil Puyat Avenue, Clark Freeport Zone, Philippines.
- b.** The site of the accident was under the aerodrome administration of Clark Development Corporation, Clark Freeport Zone. The accident was immediately relayed by the Duty Guard on-site to the Public Safety Division-Integrated Command Center (PSD-ICC).

## **2.0 ANALYSIS**

### **2.1 General**

A Hughes 369HS plane with the reserved registration number RP-C6911 was on the helipad inside the Pacific Spotters Corporation compound on August 16, 2022, undergoing maintenance ground-run tests (at full rotor RPM) for rotor track and balance. It was the third day of these tests, and the pilot was on board (not restrained by the seat restraint system), and the two AMTs were on the RH Skid (outside) the plane without a way to talk (only shouts and signs). While the pilot was overreaching to the RH seat and viewing computer data, the aircraft suddenly lifted



off until it was about 12 meters high with a bank towards the right, entered into an unusual nose-up attitude, and then crashed to the ground (tail first). At its final full-stop position, the aircraft was destroyed, and the pilot was fatally injured.

The Pilot was seated at the left cockpit seat with the assistance of two (2) Aircraft Maintenance Technicians (AMTs) positioned on the RH skid of the aircraft, were doing Rotor Track & Balance tests. The right-side aircraft doors were open (figure 4).



Figure 4. The helicopter at its run-up point.

Suddenly, the aircraft lifted-off until about 12 meters high (on the process one AMT-1 fell down at about 5 feet high and AMT-2 fell down at about 10 feet high) and tilted to the right towards the rear (figure 5 and 6). Reaching the rear and facing north, it entered into a vertical nose-up (unusual) attitude with about 3 rotations on its longitudinal axis (tail down vertical) then dropped on the ground (tail first underbelly facing North) at the vacant lot across the perimeter wall and North of the lift-off point at company compound. With the momentum of ground impact towards the North, the right side of MR disc then hit the cemented ground (nose-oriented North) then finally the MR disc hit the cemented ground (fuselage was on right side down mode, nose heading about 060deg) as the last momentum to its final full-stop point about 15meters from initial (tail) impact point and about 35 meters from the lift-off point at company compound.



Figure 5. AMT-1 as he fell on the ground at 5ft high.



Figure 6. AMT-2 followed in the fall at 10ft high.

At its final full-stop point at the vacant lot across the wall of company compound, the aircraft was on its RH side at about 70deg angle (from upright position) with nose oriented towards about 045deg (figure 7).



Figure 7. Helicopter tail impacts the ground first.



Figure 8. Helicopter crashed at the other side of the fence.



Figure 9. The detached Tail Rotor and other tail components at initial impact point.



Figure 10. The helicopter lift-off and its final resting place is about 35 meters.

## 2.2 Maintenance Ground-Run Test procedures

The Quality/Safety Management of the AMO conducted the pre-activity task briefing with the pilot, 2 AMTs and other support personnel in attendance, however, the briefing was for their introduction and of the generic safety and did not expressly include the aircraft controls settings, use of pilot restraint system especially during full Rotor RPM and the use of Intercom Link.

The Pilot also conducted a separate Pre-activity task briefing with the 2 AMTs in attendance but without expressed guidance from Quality/Safety Management of the AMO especially on

aircraft controls settings, the need for Intercom Link and the use of pilot restraint system especially during full Rotor RPM.

## 2.3 Intercom Link

The Pilot, probably in need of more update data on the test activity not much availed of from shouts & signs means, had leaned (overreached) towards the right seat (where test computer was located) probably to satisfy his update need for test data results (not availed thru shouts & signs). The insufficient update data for CRM thru Shouts & Signs probably triggered the unsafe act of the Pilot to verify computer data at the right seat by overreaching. Hence, with Collective Friction at low, with collective lever at down and unlocked position and with only a downward *push* by the Pilot in effect, the pilot's overreaching act to the right (without seat restraint in effect) probably had released downward collective stick pressure and triggered the collective lever to snap-up that resulted in the aircraft sudden lift-off.

## 2.4 Collective Control Settings

The Pilot's collective stick control settings after the accident were found at Low Friction mode. With such collective settings, the Pilot, during his overreaching act to the right seat to view computer Track & Balance data status, probably had released downward pressure on collective stick by the left hand that resulted in the collective stick to snap-up (characteristic of type/model) and in aircraft to lift-off all the way uncontrollably (with cyclic stick not duly set also) until the aircraft crashed. The collective stick that snapped-up was not stabilized (stopped and pushed back by pilot at down position) at least to stop/reduce the continuous lift-off (snap-up position) until stabilized at a low hover status.

## 2.5 Cyclic Control Setting

Pilot's cyclic stick control setting after the accident was found as improperly set (to the left and front – no slack, to the right - at half slack only, to the back - at full slack). During the sudden lift-off, with the cyclic controls improperly set, the pilot (not rated in aircraft type/model) was unable to control and stabilize the aircraft and re-land safely. Instead, the aircraft, during the sudden lift-off followed the pattern based on the open cyclic settings towards the right and back as observed during the sudden lift-off with the aircraft flight trajectory upwards, with continuous right bank and nose up and with rotation to the right on its longitudinal axis before it dropped down to the ground with impact sequences.

## 2.6 Pilot's Seat Restraint System

Pilot's Seat Restraint System was not used throughout the ground run test especially during the third day of ground-run with portions at full Rotor RPM. Without expressed guidance from Management and being non-rated in aircraft type/model, the pilot did not initiate using the seat restraint system for safety purpose. Likewise, the AMTs, also without expressed guidance during the pre-activity tasked briefing did not rectify the unsafe condition thru effective CRM by reminding the pilot. Hence, when the aircraft suddenly lifted-off with unusual attitude, the



Pilot was not secured by the Seat Restraint System to remain on seat for effective aircraft control.

The Pilot, probably with improperly set cockpit controls (cyclic, collective) was unable to stabilize the aircraft unusual flight attitude and probably had been displaced backward on his seat that induced an aircraft nose up attitude (due to cyclic setting at full slack backward open) with rotation on its longitudinal axis (due to cyclic half slack towards the right) and was still able to probably roll-back throttle to idle position before the aircraft dropped down on ground tail first on a crash. (The Engine Teardown Inspection showed Fuel Control Unit (FCU) indicating (mechanically) in idle position, among others).

## 2.7 Communications

The significance of active and effective communications system among aircrew thru the Intercom Link was not duly emphasized by the Pilot to be availed of during the pre-activity task briefing during the test activity had deprived the pilot the receipt of clear updates (through shouts & signs) on relevant test data and that the pilot resorted to overreaching to the right cockpit seat to satisfy his need of update data thru the computer data inputs and update status about Rotor Track & Balance.

With shouts & signs as means of communication among primary tasked personnel, there was difficulty for pilot to twist his head towards the right & back to be clarified on any important data (except if AMTs proceed to the RH cockpit door for better verbal communication) and considering that this activity is his first time on the aircraft type/model and on the tasked group as a team.

The Pilot's overreaching act to the right seat to verify computer data inputs before the sudden lift-off had probably released downward pressure on the collective stick which was in the low friction mode that allowed the collective stick to snap-up for a sudden lift-off.

## 3.0 CONCLUSIONS

### 3.1 FINDINGS

- a. The aircraft was undergoing ground-run maintenance test particularly for rotor tracking & balancing when the event happened.
- b. The Pilot, was seated at the left cockpit seat.
- c. The pilot and maintenance personnel have no intercom link to communicate during the maintenance activity.
- d. Pilot's cyclic stick control setting after the accident was found locked.
- e. The Pilot's collective stick control settings after the accident were found at Low Friction mode.
- f. The aircraft suddenly lifted off until it was about 12 meters high with a bank towards the right, entered into an unusual nose-up attitude, and then crashed to the ground.



## 3.2 Probable Causes

### 3.2.1 Primary Cause Factors

- a. The Pilot's overreaching act towards the RH seat to view computer data inadvertently released pressure on the collective stick (at low friction mode) that resulted in collective stick snap-up and in aircraft sudden lift-off.

## 4.0 SAFETY RECOMMENDATIONS

4.1 As a result of the investigation, the AAIB proposed the following safety recommendation to the CAAP-FSIS:

- a. The operator should ensure that their maintenance procedures include the provision of an intercom link or similar mode of communication to the pilot and maintenance personnel during maintenance ground-run tests or similar activities.
- b. The operator should ensure that their maintenance procedures include the use of the pilot's seat restraint system during ground-run tests or similar activities.

-----End-----



