Republic of the Philippines
DEPARTMENT OF TRANSPORTATION
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES
MIA Road, Pasay City 1300

AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

FINAL REPORT

RP-C2205
ARCHER II, PA-28-181

OPERATOR: FAST AVIATION ACADEMY, INC.

TYPE OF OPERATION: GENERAL AVIATION

DATE OF OCCURRENCE: JANUARY 16, 2021

PLACE OF OCCURRENCE: RUNWAY 06, SKY HAWK AIRPARK, TUY, BATANGAS, PHILIPPINES

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(Archer II, PA-28-181, RP-C2205 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.

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FINAL REPORT

TITLE: An incident involving a Piper Aircraft Inc., Archer II, PA-28-181 type of aircraft with Registry Number RP-C2205 operated by FAST Aviation Academy, Inc., that had a runway incursion at Runway 06 at Sky Hawk Airpark, Tuy, Batangas, Philippines, on January 16, 2021 at about 1604H/0804 UTC.

Notification of Occurrence to National Authority

The notification of incident to AAIIB CAAP was relayed by the Operator of the aircraft at 1730H (LOCAL) on January 16, 2021.

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 on the CAAP website on **09 February 2022.**

Synopsis:

On January 16, 2021at about 1604H, a Piper Aircraft Inc., Archer II, PA-28-181 type of aircraft with Registry Number RP-C2205 operated by FAST Aviation Academy, Inc., had a runway incursion at Runway 06 at Sky Hawk Airpark, Tuy, Batangas, Philippines. The pilot did not sustain any injuries, however the aircraft sustained minor damage as a result of the incident. Visual Meteorological Condition (VMC) prevailed at the time of the incident. The cause of the occurrence was attributed to the lack of situational awareness of the pilot on aerodrome ground movement during take-off resulted in a runway incursion.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AANSOO	:	Aerodrome and Air Navigation Safety Oversight Office
ATC	:	Air Traffic Controller
ATOC	:	Aviation Training Organization Certificate
CAAP	:	Civil Aviation Authority of the Philippines
CFI/FI	:	Flight Instructor Training
CPL	:	Commercial Pilot License
IR	:	Instrument Rating
NAIA	:	Ninoy Aquino International Airport
NLG	:	Nose Landing Gear
OFSAM	:	Office of the Flight Surgeon and Aviation Medicine
PPL	:	Private Pilot License
RWY	:	Runway
VFR	:	Visual Flight Rules
VHF	:	Very High Frequency
VMC	:	Visual Meteorological Conditions

1. FACTUAL INFORMATION

Aircraft Registration No.	:	RP- C2205
Aircraft Type/Model	:	Piper Aircraft Inc., /Archer II, PA-28-181
Operator	:	FAST Aviation Academy, Inc.
Address of Operator		Unit 8, Broadlands Bldg. BP Mayuga Street, NAIA Road Barangay Tambo, Parañaque City, Philippines
Place of Occurrence	:	Runway 06, Sky Hawk Airpark, Tuy, Batangas, Philippines
Date/Time of Occurrence	:	January 16, 2021/ 1604H/0804 UTC
Type of Operation	:	General Aviation
Phase of Flight	:	Take-off
Type of Occurrence	:	Runway incursion by a person

1.1 History of Flight

On or about 1604H, January 16, 2021, a Piper Aircraft Inc., Archer II, PA-28-181 type of aircraft with Registry Number RP-C2205 with one pilot and a passenger on-board sustained substantial damage on its propeller and nose landing gear following a rejected take-off for a local flight at a privately owned airstrip at Runway 06, Tuy Batangas, Philippines. The aircraft is being operated by FAST Aviation Academy, Inc., under general aviation. Both occupants were not injured. Visual meteorological conditions (VMC) prevailed on the time of occurrence, and no local flight plan had been filed.

The pilot during the take-off run noticed a person riding a bicycle crossing the runway. The pilot aborted the take-off and applied maximum brakes to stop the aircraft, however the aircraft veered towards the left side of the runway. While maneuvering the aircraft back to the center of the runway, the aircraft propeller came in contact with the ground. The nose landing gear was also detached when it collided with the cemented end portion of the runway threshold. The aircraft came to a full stop and settled in an upright position with the aircraft final point is located at coordinates 14°0’58.99” N, 120°44’18.80” E and heading approximately 200 degrees.

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Figure 1. The aircraft at its final resting point.

1.2 Injuries to Person (s)

Injuries	Crew	Passengers	Others	TOTAL
Missing/Fatal	0	0	0	**0**
Serious	0	0	0	**0**
Minor	0	0	0	**0**
None	0	0	0	**0**

1.3 Damage to Aircraft

The aircraft sustained substantial damage.

1.4 Personnel Information

1.4.1 Pilot (P)

Gender	:	Male
Date of Birth	:	May 22, 1979
Nationality	:	India
License	:	128505 -Commercial Pilot License (CPL)
Valid up to	:	October 31, 2022

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Type rating	:	Airplane: Single & Multi Engine Land-Instrument-C172, PA28-181, PA34-220T, C208B; A320(12-17-2019).
Medical Certificate Valid until	:	Valid until March 29, 2021
Date of last medical	:	September 29, 2020
Total Flying Time	:	3,998 + 295 Hours
Total Flying Time On type	:	3,462 + 01 Hours

1.5 Aircraft Information

The PA-28-181 is a single-engine piston aircraft with fixed landing gear. The PA-28-181 Archer II seats up to 3 passengers plus 1 pilot, developed by Piper Aircraft Inc. The aircraft with registration number RP-C2205 was manufactured in 1976.

1.5.1 Aircraft Data

Registration Mark	:	RP-C2205
Manufacturer	:	Piper Aircraft Inc.
Country of Manufacturer	:	USA
Type/Model	:	PA-28-181/Archer II
Owner	:	FAST Aviation Academy, Inc.
Operator	:	FAST Aviation Academy, Inc.
Serial No.	:	28-8190241
Date of Manufacture	:	1981
Certificate of Airworthiness	:	March 9, 2021
Certificate of Registration	:	November 2, 2019 Extended Validity thru MC# 10-2020 Dated March 13, 2020
Category	:	Normal
Number of Flight Crew	:	1
Number of Passenger	:	3
Airframe total time	:	8,500+49 Hours since last C of A

1.5.2 Engine Data

The O-360-A4M engine was first entered into service in 1955, the Lycoming O- 360 Series is a family of four-cylinder, direct drive, horizontally opposed, air-cooled, piston aircraft engines. Different variants of the O-360 produce between 145 and 225 hp. The Lycoming O-360-A4M produces 180 hp at 2700 rpm. This engine remains in active and in production service.

Manufacturer	:	Lycoming
Type/Model	:	O-360-A4M
Engine Serial Number	:	RL36439-36A
Time Between Overhaul	:	1,000 hours
Time Since Overhaul	:	138+49 hours
Time Since New	:	1,989 hours

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1.5.3 Propeller Data

The aircraft is equipped with a two-bladed Sensenich propeller. The 76EM8 Aluminum Propeller is designed for use on the Lycoming O-360 180 horsepower engine. Visual inspection was conductedon the propeller and engine propeller shaft assembly for possible crack or leaks. There were no indication of inconsistencies observed on the said parts.

Manufacturer	:	Sensenich
Type/Model	:	Metal/76EM855-0-62
Propeller Serial Number	:	25414K
Time Between Overhaul	:	2,000 hours
Time Since Overhaul	:	138+49 hours
Time Since New	:	6,771+11 hours

1.6 Meteorological Information

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

1.7 Aids to Navigation

The flight is being conducted through Visual Flight Rules (VFR). VFR are set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see visual ground references and where the aircraft is going.

1.8 Communications

The aircraft is equipped with operational Very High Frequency (VHF) transceiver used for communicating with aerodrome personnel and pilots in the area.

1.9 Aerodrome Information

Sky Hawk Airpark is located at Jose Marie l. Ramos Compound, Poblacion Tuy, Batangas, Philippines and is listed in the aerodrome and air navigation facility under the Aerodrome And Air Navigation Safety Oversight Office (AANSOO).

1.9.1 General Information

Aerodrome Name	:	Sky Hawk Airpark
Coordinates	:	163540.2182N 1201811.2422E
Aerodrome Operator & Address	:	Jose Marie l. Ramos Compound, Poblacion Tuy, Batangas, Philippines
Runway Direction	:	06 /24
Runway Length	:	730 meters
Runway Width	:	30 meters
Runway Elevation	:	89 meters
Surface	:	Grass

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Surface Strength	:	45 Tons
Types of traffic permitted	:	VFR
Restaurants	:	At the town proper
Transportation	:	Vehicle for hire.
Visual Ground Aids	:	Standard day markers and wind direction indicator.
Facilities	:	Private Hangar, Rescue and Fire Fighting Equipment, First aid Kits, medical clinic and transportation.
Rescue equipment	:	Portable firefighting equipment
Capability for removal of disabled aircraft	:	Nil.
Runway (RWY) markings	:	RWY designation markings, threshold markings, Touchdown zone markings, RWY side stripes, Aiming points.
Aerodrome Obstacles	:	24 APCH zone: Trees, antenna

1.10 Flight Recorders

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

1.11 Wreckage and Impact Information

While maneuvering the aircraft for safety, the aircraft propeller came in contact with the ground. The nose landing gear was detached when it collided with the cemented end portion of the runway threshold. The aircraft came to a full stop and settled in an upright position with the aircraft final point is located at coordinates 14°0'58.99" N, 120°44'18.80" E and heading approximately 200 degrees.

Figure 2: The aircraft with damaged NLG and propeller

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1.12 Medical and Pathological Information

Post-accident medical examination conducted to the Pilot by CAAP-OFSAM revealed no significant findings.

1.13 Fire

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

1.14 Search and Survival Aspects

Since the occurrence was located at an aerodrome, local emergency responders were able to reach the site immediately. The occurrence was survivable because the integrity of the cockpit was not impaired. The seat and restraint remained intact after the event.

1.15 Organizational and Management Information

1.15.1 Operator

Flight And Simulator Training Academy, Inc. (FAST Academy, Inc.) is located at RPMCI Hangar, Manila Domestic Airport Complex, Pasay City, Philippines, it was registered with the Securities and Exchange Commission on September 3, 1992. The institution is also duly approved and licensed by the Civil Aviation Authority of the Philippines (CAAP) with an Aviation Training Organization Certificate (ATOC) Number 1992-50. Currently it is operating six (6) Cessna 152, four (4) Cessna 172, one (1) Piper Seminole and one (1) Piper Aztec. It also operates one (1) ATC710 simulator and two (2) Elite P-135PCATD simulators for Single Engine and ATC820M simulator for Multi Engine. FAST Training Programs includes Private Pilot Training (PPL), Commercial Pilot Training (CPL), Flight Instructor Training (CFI/FI) and Instrument Rating (IR) Ground/Flight School Classes.

1.15.2 Maintenance

The maintenance function of RP-C2205 is being undertaken by Pegasus Air Services Inc. Repair Station with official address at Plaridel Community airport, Plaridel Bulacan, Philippines.

2.0 ANALYSIS

2.1 General

On or about 1604H, January 16, 2021, a Piper Aircraft Inc., Archer II, PA-28-181 type of aircraft with Registry Number RP-C2205 with the pilot and a passenger on-board. The Pilot saw a person riding a bicycle crossing from right to left about 100 meters from the end of runway 06 while the aircraft was on its it's take-off run. The pilot immediately performed the general procedure for a rejected takeoff. The person was able to cross the

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runway as the aircraft continued the deceleration process. The aircraft sustained substantial damage on its propeller and nose landing gear as a result of the collision with the concrete runway pavement.

2.2 Runway Crossing Incursion

A Runway Crossing Incursion is considered to occur when an aircraft or vehicle driver/other entity cross an active runway. In order to complete an intended aerodrome ground movement, it comes into actual or potential conflict with an aircraft using the same runway for take-off or landing.

When such circumstances arise and an incursion begins, adequate situational awareness on the part of at least one of the parties involved (ATC, the aircraft landing/taking off, and the vehicle driver/other entity crossing). However, the relative speed of the person riding a bicycle crossing should provide a reasonable chance that the seriousness of the resultant incursion can be contained if situational awareness of one or more of the other parties is properly maintained. Situational awareness is fundamental to both the prevention of runway crossing incursions and the mitigation of their effects once an incursion has begun.

Mitigating the consequences of a crossing incursion, the two principal ways in which the consequences of an incursion can be mitigated are the recognition of an imminent risk of conflict by the pilot or vehicle driver involved or by the designated runway marshal. In the case of pilot and vehicle driver, it is important that they are aware of the direction of use of any active runway they are about to cross to check for potential conflict in the appropriate direction. Further, it revealed that there was no assigned marshal to secure the runway crossing areas during aircraft operations.

The pilot during the incident performed the general procedure for a rejected takeoff where the pilot set: Power Idle, Maintain Directional Control, Maximum Necessary Braking. There are a few things that the pilot should take into consideration when performing "maximum necessary braking." When the aircraft near rotation speed, there isn't much weight on the tires, because the wings are generating lift. It's easier to lose directional control if the pilot is aggressive on the brakes during a rejected takeoff. In this case, the Pilot aggressive brake application on the grass runway, reaching the declination and uneven parts of the runway surface tends to agitate the aircraft movement incurring propeller strike. The nose landing gear (NLG) collided with the runway concrete surface while skidding towards the right side. The NLG assembly was detached as a result of the collision.

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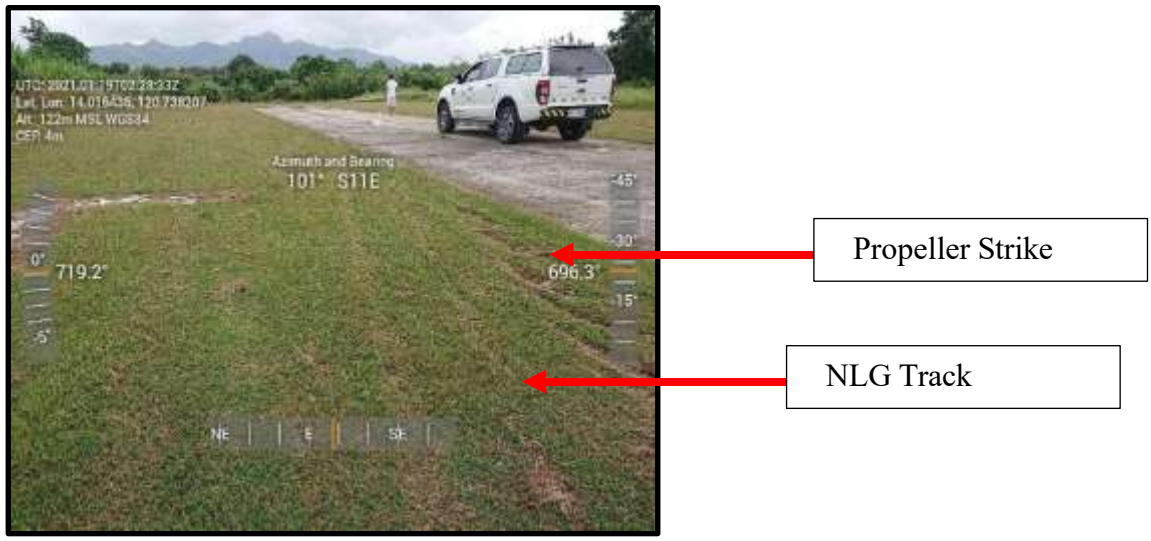

Figure 3: Wheel tracks entering the concrete part of the runway

Figure 4: NLG scrape marks on the runway

2.3 The 50/70 Rule

The "50/70 Rule" for small aircraft says if you haven't reached 70% of your takeoff speed by the time you've reached 50% of the length of the runway, you should reject your takeoff and safely stop before the runway ends.

The pilot should have a landmark which is about 50 percent of the runway length and also at 70 percent. When an aircraft starts to takeoff from the runway, it needs to achieve the desired take-off speed by the time it reaches the 50 percent marker. If it gets to the 50 percent marker and the aircraft is not at the desired takeoff airspeed, it's time to abort. And since the pilot can stop the aircraft much faster than it can accelerate, then the pilot has enough room to safely stop the aircraft on the runway.

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Pilots should always use a takeoff performance charts to make sure they have enough runway for a safe takeoff. But after that, using the 50/70 rule gives a very good insurance plan when the aircraft is rolling down the runway. If things don't go as planned and they are not getting the performance they expected during takeoff, they have a solid "abort takeoff" decision point, with plenty of room to stop. In this case, the pilot missed to consider the said 50/70 rule.

3.0 CONCLUSIONS

3.1 Findings

a. The aircraft was certified, equipped, and maintained in accordance with CAAP-PCARs and approved procedures.

b. The aircraft was properly released for flight without any discrepancies noted on its logbook.

c. The pilot was qualified on the Piper Aircraft Inc., PA-28-181/Archer II type of aircraft.

d. The occupants egress the aircraft safely.

e. Weather was not a factor in the occurrence.

f. The aircraft has valid Certificates of Airworthiness and Registration.

3.2 Probable Cause

3.2.1 Primary Cause Factor

a. Lack of situational awareness of the pilot on aerodrome ground movement during take-off (Human Factor).

3.2.2 Contributory Cause Factor

a. Lack of aerodrome marshal to secure the runway crossing areas during aircraft operations (Human Factor).

b. Failure of the pilot to maintain directional control of the aircraft after rejected take-off (Human Factor).

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4.0 SAFETY RECOMMENDATIONS

4.1 That CAAP-AANSOO should ensure that runway with crossing access areas must be manned by runway marshal to prevent runway incursion during aircraft operations.

-END-

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