# TITLE

## GENERAL INFORMATION:

| | |
|---|---|
| Name of Operator: | Air Services Limited |
| Aircraft Manufacturer: | Cessna Aircraft Company |
| Aircraft Model: | U206E |
| Nationality and Registration Marks: | 8R-GMA |
| Place of Accident/Region: | Bath Settlement Airstrip/Region#5, Guyana – 06 22 34.27N 057 36 25.10W |
| Date of Accident: | 20th June 2016 |
| Time of Accident: | 21:45hrs UTC |

**REPORT NO. GAAIU:3/1/9**

**This investigation was conducted in accordance with ICAO Annex 13 and therefore, it is not intended to apportion blame, or to assess individual or collective liability. Its sole objective is to draw lessons from the occurrence which may help to prevent future accidents. Consequently, the use of this report for any purpose other than for the prevention of future accidents could lead to erroneous conclusions.**

*Note: - All times in this report are Coordinated Universal Time (UTC) unless otherwise stated. UTC is four hours ahead of Guyana Standard Time (GST).*

## CONTENTS:

## GLOSSARY OF ABBREVIATIONS

| | | |
|---|---|---|
| AIP | - | Aeronautical Information Publication |
| ANS | - | Air Navigation Services |
| ASL | - | Air Services Limited |
| ASRD | - | Aviation Safety Regulation Directorate |
| AMO | - | Approved Maintenance Organisation |
| AOC | - | Air Operator Certificate |
| ATPL | - | Airline Transport Pilot Licence |
| EFCIA | - | Eugene F. Correia International Airport |
| GAAIU | - | Guyana Aircraft Accident and Incident Investigation Unit |
| GCAA | - | Guyana Civil Aviation Authority |
| ICAO | - | International Civil Aviation Organisation |
| S/N | - | Serial Number |
| TBO | - | Time before Overhaul |
| TSN | - | Time since New |
| TSO | - | Time since Overhaul |
| VMC | - | Visual Meteorological Conditions |

## Synopsis:

During the takeoff roll the aircraft started to drift right of the imaginary centerline of the narrow runway. The aircraft was air borne for a short while but touched back down on the runway and continued rolling toward the right. The aircraft crossed a trench and ended up nose down in a flooded rice field.

Five persons, the pilot and four passengers, who were on board the aircraft, were all able to exit the aircraft unaided. They suffered minor cuts and bruises.

There was no fire.

# 1. Factual Information

## 1.1. History of the Flight

The aircraft departed from the company base at the Eugene F. Correia International Airport (EFCIA) to collect four company employees who were engaged in seeding a rice field, in the vicinity of the Bath Settlement Airstrip (SYBS), with a Thrush Commander aircraft. The pilot reported that the takeoff from EFCIA and the landing at Bath Settlement were normal.

The passengers boarded the aircraft for departure. The normal pre-taxi and pre-takeoff checks were carried out. During the takeoff roll, the aircraft suddenly started to drift to the right. Efforts to correct this right drift were not successful and the aircraft became air borne for a short while but remained in ground effect. The aircraft touched back down. It then continued going right and crossed a trench and ended up nose down in the flooded rice field.

## 1.2. Injuries to Persons

**Table: 1- Showing Injuries to Persons**

| Injury | Crew | Passengers | Others | Total |
|---|---|---|---|---|
| **Fatal** | 0 | 0 | 0 | **0** |
| **Serious** | 0 | 0 | 0 | **0** |
| **Minor/None** | 1 | 4 | 0 | **5** |
| **Total** | **1** | **4** | **0** | **5** |

The pilot and four passengers suffered minor injuries.

## 1.3. Damage to aircraft

The aircraft was partially submerged in water in the flooded rice field. Most of the damage was observed on the port wing of the aircraft which had made contact with the dam.

## 1.4. Other Damage

There was no other damage.

## 1.5 Personnel Information - Pilot

| | |
|---|---|
| Gender: | Male |
| Date of Birth/Age: | 17th January 1972 / 44 years |
| Nationality: | British |
| License: | Guyana ATPL #117 |
| Date of issue: | 12th October 2009 |
| Date of last medical: | 25th January 2016 |
| Valid until: | 31st July 2016 |
| Aircraft type rating: | C172, C206, C208, BN2 Islander, PA34-200T, PA28R |
| Last Proficiency Check on Type: | 27th January 2016 |
| Total hours: | 12,416:54hrs |
| Hours in last 90 days: | 27:08hrs approx. |
| Hours in last 7 days | 1:26hrs |
| Hours in last 24 hours: | :25hrs |

## 1.6 Aircraft Information

### 1.6.1 General

| | |
|---|---|
| Manufacturer: | Cessna Aircraft Company |
| Year of Manufacture: | 1971 |
| Aircraft Model: | U206E |
| Aircraft S/N: | U20601614 |
| Certificate of Registration: | Issued – 28th June 1995 |
| Certificate of Airworthiness: | Valid until 10th March 2017 |
| Total Airframe Hours: | 13,705:39hrs |
| Maximum Take-off Weight: | 3,600lbs |
| Engine Model: | Continental IO 520-F9B |
| Engine S/N: | 1009520 |
| Engine TSN: | 675:24hrs |

| | |
|---|---|
| Last Scheduled Inspection (Type): | 100hrs |
| Time since last Inspection: | 12:41hrs |
| Propeller Type: | Hartzell 3-blade PHC-C3YF-1R |
| Propeller S/N: | QG458B |
| Propeller TSN: | 1528:09Hrs |
| Fuel Type: | AVGAS 100LL |

The aircraft is a six-seater, single engine, utility aircraft with strut braced high wings. Its fuselage is semi-monocoque with aluminum spars, stringers, and frames covered by aluminum alloy skins. It is equipped with a fixed tricycle landing gear. On the ground, the aircraft is steered by its nose gear and the rudder control.

### 1.6.2. Maintenance

Examination of the aircraft maintenance records indicates that there were no outstanding maintenance issues. All required and scheduled maintenance had been performed and all Airworthiness Directives had been complied with. There were no outstanding MEL items on the aircraft. There were no deferred defects listed, nor any reported defects from the previous flight. The last scheduled 100-hours inspection was done 12:41hrs before this accident. Total airframe time on the aircraft prior to the accident was 13,704:49hrs. Total engine time was 675:24hrs.

### 1.6.3. Mass and Balance

There were four passengers on board the aircraft, along with a small toolkit. Information from the Load Sheet indicates a total payload of 666lbs and a takeoff weight of 3231lbs. The total payload represents the weight of four passengers and a small tool kit.

A Flight Manifest was also submitted. This indicated that there were three passengers and the person sitting in the co-pilot seat was represented as flight crew. The manifest presented a total payload of 510lbs.

### 1.7 Meteorological Information

The weather reported at the time of the occurrence was – Wind calm, visibility 10km or more, few stratus clouds at 2000ft.

### 1.8 Aids to Navigation

Not applicable.

### 1.9 Communications

At the time of the occurrence the aircraft was taking off. Thus, communication with the Air Traffic Services had not yet been initiated. Communication between the Air Traffic Services and the aircraft were satisfactory on the inbound flight to Bath Settlement Airstrip.

### 1.10 Aerodrome Information

The following information, pertinent to the Bath Settlement Airstrip, was taken from the Checklist of Hinterland Aerodromes compiled by the Aerodromes Inspectorate of the Guyana Civil Aviation Authority.

| | |
|---|---|
| Aerodrome identification: | SYBS |
| Coordinates: | 06 22 34.27N 057 36 25.10W |
| Elevation: | 0 ft. |
| Runway orientation: | 08/26 |
| Runway length: | 2,115ft |
| Runway width: | 36ft |

The airstrip is located in Region No.5, in the coastal area of Guyana. The total length of the runway is 2,115ft but only 1,428ft of the runway is paved with concrete. 687ft is unpaved. The only visual aid is a wind sock which is located on the left of the threshold of Runway 08.

### 1.11 Flight Recorders

This aircraft is not required by regulation to be equipped with a flight recorder.

## 1.12 Wreckage and Impact Information

Tracks in the overgrown grass indicated that both the starboard and port main wheels exited the right shoulder of runway 08. The starboard wheel exited the runway first and its track was measured at an angle of 14.4° and 1,100ft from the beginning of the runway. The track of the port main wheel indicated that it contacted the grass off the runway after the starboard main wheel. There was no indication of a nose wheel track on the grass. The aircraft crossed a trench and a mud dam and came to rest, partially in the flooded rice field. The nose wheel, one blade of the propeller and the starboard main wheel were submerged in the rice field, while the port main wheel rested on the dam.

Picture No. 1: Showing final position of Aircraft

The port wing leading edge, which had made contact with the dam, was dented inwards. The port wing tip speed fairing was hanging onto the wing tip. The port flap inner trailing edge was bent upwards against the fuselage for two inches.

Two blades of the propeller were visible and displayed signs of distortion consistent with being powered at the time of impact.

The tail tie-down ring was bent against the empennage.

Picture No.2: Showing another view of the aircraft off the edge of the airstrip and the trench which the aircraft crossed before stopping in the rice field

### 1.13 Medical and Pathological Information

The pilot was not subjected to any medical or pathological testing.

### 1.14 Fire

There was no fire.

### 1.15 Survival Aspects

The cabin and the cockpit of the aircraft were intact after the accident. The pilot's seat harness and all seat belts were intact. All of the seats were secure in the seat rails except the starboard seat in row 2, which was forward against the co-pilot seat, with its two forward supports out of the rails.

### 1.16 Tests and Research

No special tests or research were carried out.

## 1.17 Organisational and Management Information

### 1.17.1 Air Services Limited

Air Services Ltd (ASL) is one of the oldest aircraft operators in Guyana. It is also the largest operator with a fleet of twenty-five aircraft comprising Cessna 172, Cessna 206, Cessna 208, Bn2A Islanders, Thrush Commanders (crop dusters), Pipers and helicopters.

The company acquired its Guyana Air Operator Certificate No. 001 from the Guyana Civil Aviation Authority in 2002. The company does domestic scheduled and charter, passenger and cargo operations.

The management structure includes the Accountable Manager, the Director of Operations, the Chief Pilot and the Safety Manager. The pilot who was involved in this accident is the company's Chief Pilot/Director of Operations. He meets all the requirements to hold these positions.

The company carries out its own maintenance and acquired an Approved Maintenance Organisation certificate No.003 issued by the GCAA in 2003.

## 1.18 Additional Information

The pilot was interviewed by the accident investigation team. He was unable to explain how the accident occurred. He stated that he was well rested, having spent a quiet weekend. Prior to the accident flight he spent the morning doing office duties which were not stressful. The flight from the company base to Bath Settlement Airstrip was 25 minutes long and there were no problems on this leg.

He stated that he boarded the four passengers, did the required pre-taxi checks, taxied into position and did the pre take-off checks. For the takeoff, the weather was good, the runway was dry and clean, there was no problem with the aircraft, and it was not overloaded. For takeoff he set the flaps at 20° in order to use a shorter ground roll, and the manual also recommends 20° flaps for best takeoff performance. He asserted that the aircraft was lined up with the center of the runway when he started the ground roll and during the initial takeoff roll. He stated, that during the takeoff roll, when the aircraft reaches a certain speed, the nose wheel will come off the ground, he does not have to lift it off the ground. He rotated the aircraft at about 40-45kts. Just after the nose wheel lifted

off the ground the aircraft suddenly went to the right. He attempted to correct but he had limited control, as the aircraft was still in ground effect as the main undercarriage was still touching the ground and rolling to the right. He also recognised that he should have been accelerating but this could not be done because the aircraft was still in ground effect. So, the aircraft continued to the right and ended up on the dam separating the rice field from the canal which is next to the runway.

### 1.19. Useful or Effective Investigation Techniques

No special investigation techniques were used.

## 2. Analysis

### 2.1. The Pilot

The pilot is 44 years old. He obtained his Guyana ATPL #117 in 2009. He is rated and has command on all aircraft types operated by the company except the Thrush Commander and the helicopters. There are no limitations on his Guyana Class 1 Medical which is valid until 31st July 2016. There was no evidence of any pre-existing medical or behavioural conditions which may have adversely affected the pilot's performance during this flight.

### 2.2. The Aircraft

#### 2.2.1. Maintenance

The aircraft has a Certificate of Airworthiness which is valid until 10th March 2017. Records indicate that the aircraft was being maintained in accordance with the approved maintenance schedule. There were no noted defects or deferred defects from the previous flight.

#### 2.2.2. Mass and Balance

The load sheet was prepared and signed by the captain. However, he did not insert the date near to his signature. The date typed on the load sheet was smudged, so it was difficult to determine its date of preparation. This also caused some doubt as to whether the load sheet was prepared after the accident and not before the departure of the flight as required by Article 34 of the Guyana Civil Aviation (Air Navigation) Regulations 2001. The Flight Manifest which was presented, differed from the load sheet. It reflected one of the passengers, who was sitting in the co-pilot seat, as a crew member. Although this person is a company pilot, he had no role in the crewing of the aircraft and therefore cannot be considered as a crew member. This also accounted for a difference in payloads between the Load sheet and the Flight Manifest. This can affect accuracy of the final documentation.

#### 2.2.3. The Takeoff

After the pilot taxied into position, he lined up the aircraft on the imaginary centerline of the runway, did the required pre-takeoff checks, and started the takeoff run. It is apparent

that at some time during the takeoff run the aircraft started to drift to the right of the runway centerline. The nose wheel lifted off the ground and this hampered attempts to steer the aircraft back to the left, as nose wheel steering was not available. The aircraft became airborne, but, having been rotated early, it remained in ground effect, being slow and low, for about 200-300ft over the ground. During this time the aircraft lost altitude, the main wheels ran off the runway and the left wing dug into the mud.

If the nose of the aircraft had remained on the ground, the pilot would have been able to accelerate the aircraft and achieve enough speed to sustain flight. However, with the early rotation and the aircraft already bearing right, directional control was difficult. The fact that directional control problems were being experienced indicates that the aircraft was not in level flight along the runway center line.

Further if an aircraft is inclined to run off a narrow runway the natural reaction would be to pull the aircraft up off the ground and try to get it flying. The pilot noted that the manual recommends lifting the nose wheel at 60mph which is about 50-52kts. So, he asserted that he was in compliance with the manual. It was however pointed out that the manual figures are for a normal takeoff, but this takeoff was intended to use the short field technique, which was not properly executed. The aircraft was not where it was supposed to be and it was not going where it was supposed to be going, so it was pulled up earlier than under normal circumstances.

### 2.3. The Airstrip

The airstrip has a total length of 2115ft and width of 36ft. The unpaved portion of 687ft is not properly prepared for aircraft operations. This portion of the surface was damaged with several undulations and loose stones on it. Thus, aircraft operations were largely restricted to the paved portion of the runway, which is 1,425ft long and 36ft wide. The airstrip is mostly used to facilitate crop dusting activities such as seeding, fertilizing and spraying of adjacent rice fields. The only visual aid at this airstrip is the wind sock. At the time of the accident the airstrip was dry and clean. There was no residue on the airstrip from the previous aerial seeding exercise which had been done earlier that day.

## 2.4. The Weather

This accident occurred during the afternoon. It was reported that there was bright sunshine and clear skies at the airstrip. Wind was reported calm, ceiling and visibility ok.

## 3. Conclusion

### 3.1 Cause

The probable cause of this accident was that the aircraft veered right during the takeoff run. To counter this, the aircraft was rotated early, when it was too slow for flight. Being unable to sustain flight the aircraft touched back down and ran off the runway.

### 3.2 Contributory Factors

The pilot did not maintain directional control during the takeoff run and displayed poor handling techniques for a short field takeoff.

### 3.3 Findings

#### 3.3.1. The Pilot

1. The pilot's licence was valid.
2. The pilot was qualified and experienced to carry out the intended operation.
3. The pilot holds Guyana ATPL #117 which he obtained in 2009.
4. His current medical is valid until 31st July 2016.
5. His last APC on type was satisfactorily completed on 27th January 2016.
6. The pilot was familiar with the airstrip conditions, having operated into the airstrip several times recently.
7. It is considered that the pilot displayed a complacent attitude during his interview with the Accident Investigation Team and he needs to guard against this attitude.

#### 3.3.2. The Company

1. The company holds an Air Operator Certificate and an Approved Maintenance Operator Certificate.
2. The company operates a large and varied fleet of aircraft.

#### 3.3.3. The Aircraft

1. The aircraft was properly certified.
2. Maintenance records indicate that the aircraft was properly maintained.

### 3.3.4. The Weather

The weather at the airstrip was VMC and did not contribute to this accident.

## 4. Safety Recommendations

1. It is recommended that the pilot should review Crew Resource Management with emphasis on Decision Making in a single crew environment.
2. It is recommended that the pilot should review the techniques of short field takeoffs, both theory and practical.
3. The pilot should be required to complete at least six short-field takeoffs under supervision with an approved pilot.
4. It is recommended that the pilot should seriously reflect on his role and responsibilities as the pilot in command especially with regard to the safety of the aircraft and passengers on board.
5. Considering the large and varied fleet which the company operates, the company should ensure that it has enough senior staff to adequately supervise its operations. Therefore, it is recommended that the two positions, Director of Operations and Chief Pilot, should be held separately.
6. The owners of the airstrip should be required to improve conditions at the airstrip, by sealing the unsealed portion and extending the length and width of the runway.
7. The company should ensure that the regulations and requirements regarding accurate completion of the load sheet for each flight, prior to every flight, is adhered to. Other aircraft operators should also be reminded of this requirement.
8. The company should ensure that administrative and other duties do not affect the duty time limitations and the rest period requirements for pilots.