

**TITLE**



**GENERAL INFORMATION:**

Name of Operator:	Oxford Aviation Incorporated
Aircraft Manufacturer:	Cessna Aircraft Company
Aircraft Model:	U206C
Nationality and Registration Marks:	8R-GMP
Place of Accident/Region:	Ekereku Bottom Airstrip/Region#7, Guyana - 06 24 01.05N 060 51 14.46W
Date of Accident:	12 <sup>th</sup> November 2015
Time of Accident:	18:05hrs UTC

**REPORT No. GAAIU:3/1/8**

**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).*



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## **GLOSSARY OF ABBREVIATIONS**

<b>AIP</b>	-	<b>Aeronautical Information Publication</b>
<b>ANSD</b>	-	<b>Air Navigation Services Directorate</b>
<b>ASRD</b>	-	<b>Aviation Safety Regulation Directorate</b>
<b>AMO</b>	-	<b>Approved Maintenance Organisation</b>
<b>AOC</b>	-	<b>Air Operator Certificate</b>
<b>CPL</b>	-	<b>Commercial Pilot Licence</b>
<b>GAAIU</b>	-	<b>Guyana Aircraft Accident and Incident Investigation Unit</b>
<b>GARs IS</b>	-	<b>Guyana Aviation Requirements Implementing Standard</b>
<b>GCAA</b>	-	<b>Guyana Civil Aviation Authority</b>
<b>GCARs</b>	-	<b>Guyana Civil Aviation (Air Navigation) Regulations 2001</b>
<b>ICAO</b>	-	<b>International Civil Aviation Organisation</b>
<b>OAI</b>	-	<b>Oxford Aviation Incorporated</b>
<b>S/N</b>	-	<b>Serial Number</b>
<b>TBO</b>	-	<b>Time before Overhaul</b>
<b>TSN</b>	-	<b>Time since New</b>
<b>TSO</b>	-	<b>Time since Overhaul</b>
<b>VMC</b>	-	<b>Visual Meteorological Conditions</b>

**Synopsis:**

This accident involved two aircraft on the ground at Ekereku Bottom Airstrip which has a measured length of 1623ft and width of 41ft. One aircraft, a Cessna 172 was parked just center of the outer edge of the turnaround area of the runway, with its nose wheel 1 foot off the turnaround area. Thus, the propeller cone protruded into the turnaround area by approximately 2ft. The other aircraft, a Cessna U206C, landed more than half way down the runway, approximately 1000ft from the beginning of Runway 10. It touched down right of the imaginary center line at an angle of approximately 30° to the center line. During its landing roll, the aircraft veered further right, and the right wing of this aircraft came into contact with the left wing of the parked aircraft. The aircraft came to a stop 175ft beyond the end of the runway at an approximate angle of 45° right of the extended center line.

Both aircraft sustained substantial damage.

The active aircraft had only the pilot on board and cargo consisting of two drums of fuel.

There were no injuries or fatalities.

There was no fire.

## **1. Factual Information**

### **1.1. History of the Flight**

Oxford Aviation Incorporated was operating a series of domestic cargo shuttle flights between Ekereku Bottom Airstrip and Eteringbang Airstrip, both located in Region No.7 in Guyana's hinterland. The aircraft departed from Ogle International Airport at 15:17hrs on 12<sup>th</sup> November 2015. There were three persons on board; the pilot, an aircraft mechanic and one passenger, along with a tool kit and personal baggage. The load sheet information indicates that the aircraft was loaded within limits. It landed at Eteringbang Airstrip at 16:46hrs.

The accident flight was the second in a planned series of shuttles between Eteringbang and Ekereku Bottom Airstrips. On each shuttle the cargo consisted of two drums of diesel.

The accident flight departed Eteringbang at 17:47hrs and landed at Ekereku Bottom at 18:05hrs.

Wheel impressions and tyre marks on the runway indicated that the aircraft landed more than half way down the runway, right of the center line. The aircraft veered further right, and the right main undercarriage went onto the grass and sand shoulder of the runway. The right wing of the aircraft made contact with the left wing of the stationary aircraft that was parked off the turnaround area of the runway.

### **1.2. Injuries to Persons**

There were no injuries to persons.

### **1.3. Damage to aircraft**

The right wing of the active aircraft, and left wing of the stationary aircraft were both substantially damaged.

### **1.4. Other Damage**

There was no other damage.

## **1.5 Personnel Information - Pilot**

Gender:	Male
Date of Birth/Age:	13 <sup>th</sup> October 1991/ 24 years
Nationality:	South African
License:	Guyana CPL #332
Date of issue:	15 <sup>th</sup> April 2015
Date of last medical:	29 <sup>th</sup> September 2015.
Valid until:	30 <sup>th</sup> April 2016
Aircraft type rating:	C172, C206
Last proficiency check:	4 <sup>th</sup> November 2015
Total hours:	1220hrs approximately
Hours on Cessna model:	498hrs approx.
Hours in last 90 days:	212hrs approx.
Hours in last 7 days	23hrs
Hours in last 24 hours:	5.8hrs

## **1.6 Aircraft Information**

### **1.6.1 General**

Manufacturer:	Cessna Aircraft Company
Year of Manufacture:	1968
Aircraft Model:	U206C
Aircraft S/N:	U206C1117
Certificate of Registration:	Issued - 19 <sup>th</sup> April 2013
Certificate of Airworthiness:	Valid until 17 <sup>th</sup> December 2015.
Total Airframe Hours:	7725:47hrs
Maximum Take-off Weight:	3600lbs
Engine Model:	Continental IO 520-F (76)
Engine S/N:	830580-R
Engine TSN:	3977:06hrs



Engine TSO:	583:51hrs
Last Scheduled Inspection (Type):	100hrs
Time since last Inspection:	6:26hrs
Propeller Type:	Hartzell-PHC-C3YF-1RF/F8468A-6
Propeller S/N:	EE5222B
Propeller TSN:	501:37hrs
Propeller TBO:	2400hrs/6 years
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. There were no deferred defects listed, nor any reported defects from the previous flight.

### **1.6.2. The Cargo**

The cargo consisted of two 55-gallon drums of diesel. These drums were not weighed before they were loaded on to the aircraft. However, the company uses a standard weight of 9lbs per gallon. The calculated weight of the cargo was 990lbs. It was reported that one drum of fuel was placed in the right front of the aircraft adjacent to the pilot while the second drum of fuel was positioned behind the pilot. It was reported by the pilot and mechanic that both drums were chocked and secured in place with four straps each. The straps were secured to the seat belt attachment points and the seat rails tie down points and were tightened with ratchets. On arrival at the accident site, the investigators found no cargo on board the aircraft.

### **1.6.3. The Brake System**

The brake is a direct, non-powered closed hydraulic system. It is self-contained and has hydraulic brake lines running from the master cylinders in the cockpit to individual brake calipers mounted to each main wheel assembly.

The landing gear includes a parking brake system and a non-powered ground steering system that is operated by the rudder pedals.

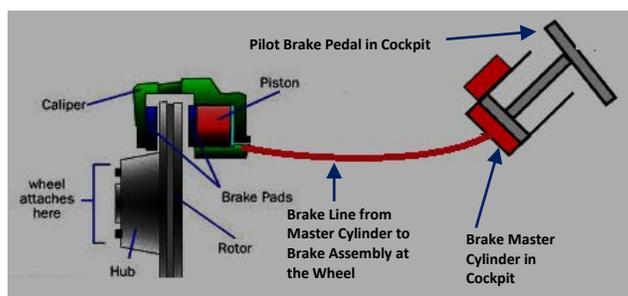


Diagram No.1 – Schematic of Cessna 206 Brake System

### 1.7 Meteorological Information

The accident occurred during the afternoon. It was reported that there was bright sunshine and clear skies at the airstrip. Rain showers were visible in the distance in areas east, west and north of the airstrip.

### 1.8 Aids to Navigation

Not applicable.

### 1.9 Communications

The pilot reported landing and closed his Flight plan for the day with the Flight Information Center using a satellite phone. However, he did not report the accident to Air Traffic Services.

### 1.10 Aerodrome Information

The following information, pertinent to the Ekereku Bottom Airstrip, is published in the Guyana Aeronautical Information Publication (AIP).

Aerodrome name:	Ekereku Bottom
Aerodrome identification:	SYEK (B)
Coordinates:	06 24 01.05N 060 51 14.46W
Elevation:	2201ft
Runway orientation:	10/28
Runway length:	1801ft
Runway width:	50ft



The airstrip is located in Region No.7. The measured runway length is 1623ft. The measured width is 41ft. The surface is paved with asphalt. Turnaround areas are located at both ends of the runway. The diameter of the turnaround area at the end of RWY10 is 96ft. The only visual aid is a wind sock which is located 1000ft on the left from the beginning of Runway 10.

### **1.11 Flight Recorders**

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

### **1.12 Wreckage and Impact Information**

The upper and lower skin surfaces of the right wing of the active aircraft had damage extending from the wing tip to the second rib. The wing tip was missing and was later located in the left wing of the stationary aircraft.



Picture No.1: Showing damage to active aircraft

The skin of the lower left wing surface of the parked Cessna 172 aircraft was peeled back from the wing tip to the 4<sup>th</sup> rib inboard and the skin and ribs were left hanging. There was no other visible damage to this aircraft.



Picture No.2: Showing damage to the parked aircraft

### **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 only occupant of the accident aircraft was the pilot. There was no damage to his seat or seat belt.

### **1.16 Tests and Research**

No special tests or research were carried out.

### **1.17 Organisational and Management Information**

#### **1.17.1 Oxford Aviation Incorporated**

Oxford Aviation Inc. commenced commercial aircraft operations in July 2012 after it acquired a Guyana Air Operator Certificate No.010 issued by the Guyana Civil Aviation Authority. The current AOC is valid until 25<sup>th</sup> July 2016. The company operates two Cessna 206 aircraft, which are used for combination passenger/cargo operations.

Apart from the pilot, other operations staff include an Operations Manager who is also the company's Security Officer and an Operations Superintendent who is also the company's Maintenance Coordinator. Training records for these individuals were requested. Records presented for the Operations Superintendent, were "Basic Knowledge" training signed off on 21<sup>st</sup> February 2014; a letter dated 20<sup>th</sup> March 2014 from the Chief pilot advising that in-house security training was done with the Operations Superintendent; Dangerous Goods Awareness Examination paper completed on 14<sup>th</sup> April 2014; and an unsigned online General Aviation Security Course Certificate dated 7<sup>th</sup> April 2014 from the Transportation Security Administration.

The position of Operations Manager is not an approved position in the company manual. No training records were presented for the Security Officer.

It was noted that several significant changes were made to the company's approved management staff, but these are not reflected in its General Operations Manual

The company scheduled the pilot to fly without verifying that his pilot's licence was valid.

During interviews with company staff, they all indicated that the accident pilot was the company's Chief Pilot. However, the GCAA records indicate that another individual had been given temporary approval to hold this post. This person has more than thirty years' experience as a pilot and was interviewed by the Accident Investigation Team. In the interview he stated that his stay with this company was not long enough for him to be really settled or effective in carrying out the functions of Chief Pilot.

While with the company he had discussions with the accident pilot, who in his opinion, was eager to start shuttle operations in the hinterland. He said that while the accident pilot was legal, he had some reservations about releasing him, especially for shuttle operations. He stated that the pilot did not seem to have the discipline required for such operations. Further, in his opinion, the pilot did not have enough experience to handle the rigours of shuttling. His reservations were further fueled by discussions he had with senior pilots who had flown with the accident pilot. He noted that Ekereku Bottom was a difficult airstrip to operate into. He also noted that the Cessna 206 was not an easy aircraft to fly due to its nose up attitude, which could restrict the pilot's field of vision over its dashboard.



The Chief Pilot stated that despite his objections, the owner of the company released the accident pilot to do Eteringbang/Ekereku Bottom shuttles. Shortly after, he was advised, by copy of a letter that the company intended to appoint the accident pilot as its Chief Pilot. He left the job and wrote to the GCAA advising them that he was informed, by letter from the company's owner, that with effect from 20<sup>th</sup> September 2015 the accident pilot is the Chief Pilot/Operations Manager of the company.

The company acquired an Approved Maintenance Organisation certificate No.5, effective 6<sup>th</sup> July 2013 issued by the GCAA. The current AMO is valid until 5<sup>th</sup> July 2016.

## **1.18 Additional Information**

### **1.18.1. Installation of GO-PRO Camera**

Just prior to departing from his base at Ogle International Airport, and after the preflight inspection was completed, the pilot installed a Go-Pro camera on the aircraft's left wing leading edge, adjacent to the pitot tube. The camera mount was fastened with several layers of speed tape and further secured with lengths of safety wire that were wrapped and taped to the pitot tube stand. The pilot stated that he installed this camera by himself and he didn't think that anyone observed him doing this. He did not sneak to do this as he was unaware that such an attachment should not be done.

Inspection by the accident team revealed that the speed tape used to secure the camera was unevenly affixed to the wing. However, the pilot said that he was not aware that this could affect airflow over the wing of the aircraft. He was also not aware that hampering/interrupting airflow through the pitot tube could result in unreliable readings from the pitot/static instruments in the cockpit.



Picture No. 3: Showing Speed Tape and Safety Wire used to attach the Go-Pro Camera to the leading Edge of the Left Aircraft Wing

### **1.18.2. The Pilot's Accident Report**

The pilot submitted a written accident report on the 16<sup>th</sup> November 2015. He stated that during his first landing at Ekereku Bottom he felt that something was wrong with the aircraft's brakes as it was 'very intermittent'. The cargo was offloaded, and he headed back to Eteringbang airstrip where the mechanic checked and bled the brake system. He was satisfied that the problem was rectified and departed on his second shuttle. During this approach to Ekereku Bottom he 'pumped' the brakes on short final but did not notice a problem. However, upon landing he realized that the brakes were still giving intermittent braking power, with the right brake being much stronger than the left. In the braking process, during the landing roll, despite efforts to bring the aircraft back to the runway center line, the aircraft veered to the right side of the runway. When he noticed the parked aircraft, he attempted to use full left rudder to steer away from the parked aircraft but was unable to avoid same. The right wing of his aircraft contacted the left wing of the parked aircraft. His aircraft came to a stop off the runway in the sand.

He stated that there were scattered clouds and the runway was wet.

### **1.18.3. Inspection at the Accident Site**

The accident site was visited twice, first on the morning of the day after the accident, 13<sup>th</sup> November 2015 and again on the 18<sup>th</sup> November 2015. During inspection, the active

aircraft was located approximately 175ft beyond the end of the runway and approximately 20ft off the right shoulder at a 45° angle to the runway center line.

The other aircraft which was damaged in this accident was found parked off the turnaround area, with its nose wheel 1 foot from the edge of the runway with the nose cone protruding about 2ft over the turnaround area. This was 46ft from the extended center line of the runway. The diameter of the turnaround area is 96ft. During the inspection it was observed that there were several drums and large heavy metal objects that appeared to be mining equipment, just behind this aircraft.



Picture No. 4: Showing Position of Parked Aircraft

The brakes of the active aircraft were tested by manually pushing the aircraft while the brakes were applied. The brakes were firm, and the aircraft could not be moved. This test was carried out in the presence of both the aircraft owner and the pilot. No fluid leaks were observed at the main wheel area and brake calipers and the brake pads appeared to be within limits. The tyres were inspected and found to be in good condition, there were no skid marks or flat spots.

The touch down point was identified by the first wheel tracks and tyre marks which were identified right of the runway center line, starting approximately in line with the wind sock which is 1000ft on the left, from the beginning of RWY10. Eyewitness accounts also indicate that the aircraft touched down more than half way down the runway.



Eyewitness interviews revealed that the two landings, made by the active aircraft that day, mirrored each other. It was reported that for the first landing, the aircraft appeared to be coming in much higher than normal and did not stop until the end of the runway. This was verified by the identified marks on the runway.

The second landing also appeared to be the same as the first. It alarmed several persons, causing them to hurriedly remove themselves from the vicinity of the runway. The aircraft went on to the grassy shoulder, struck the parked aircraft and continued for approximately 175ft before coming to a stop in heavy sand off the runway.

Investigation of the identified marks on the runway confirms that there were two sets of tracks beginning at about the same spot. Shortly after touchdown, one set of tracks diverted further right so that the track of the right undercarriage was clearly visible in the grass on the runway shoulder. The left main wheel track was evident on the runway.



Picture No. 5:- Showing the Track of Right Under Carriage on Right Side of Runway

Eye witnesses reported that immediately after the accident, the pilot approached the staff of the other aircraft operator and apologized for the damage. He had told them that his aircraft had a braking problem.

Several witnesses indicated that the pilot's operations were usually hurriedly done. It was also reported that he did many of his flights shirtless.

It was also reported that at the time of the accident there was bright sunshine and the runway surface was dry.

#### **1.18.4. Interviews with the Pilot**

The pilot was asked to detail the circumstances surrounding the accident. He started by showing a brief video from the Go-Pro camera which he had attached to the aircraft. The video showed marks on the ground, which he felt demonstrated that the marks which were identified as those made by the aircraft during the landing roll of the accident flight were actually on the ground prior to the accident flight. He subsequently agreed with the investigation team that those marks were actually made by the same aircraft on the previous flight. He was asked about the video of the accident flight. He said that this was not available as he had turned off the camera but had not removed it from its installed position on the leading edge of the aircraft left wing.

He stated that the brakes were intermittent during the first landing at Ekereku Bottom. He returned to Eteringbang where he made a slow approach, the landing there was normal. The brakes were bled, and he was satisfied that the problem was resolved before he proceeded on the second flight. This defect was not recorded in the aircraft technical log book.

He explained that generally, he makes a long approach into Ekereku Bottom. He flies the base leg near to the foot of the mountain and turns on to final at an elevation of about 600ft. The wind sock is visible on base and final. For the accident flight there was bad weather in several sectors around the airstrip and between Eteringbang and Ekereku Bottom. The rain was observed in the north, east and west, of the airstrip, but at the airstrip itself, the weather was fine, with an estimated ten knot wind. He stated that weather was not a contributing factor in this accident. He was asked to explain his statement in his written report that the runway surface was wet when credible witnesses had stated that the runway was dry. He then said that the runway was damp and repeated that weather was not a contributory factor to the accident.

He said that he touched down well before the windsock and nearer to the runway threshold. During the landing roll he engaged the brakes and the aircraft veered to the right. He was aware that his aircraft was approaching the stationary aircraft and applied left rudder to turn the aircraft away but was unable to avoid contact.

He stated that the indicated approach airspeed was 63kts and 60kts over the threshold. The Cessna Super Sky Wagon Owner's Manual indicates that for short field landings, a

power-off approach at 76mph (66kts) with 40° flaps is recommended. The pilot explained that the aircraft is equipped with a Horton STOL kit which allows for a safe approach to be done at 60kts.

He stated that his turn around time between shuttles was 1–2 minutes. He was advised that this indicated that his operations were hurriedly done, which was corroborated by reports from eye witnesses at the airstrip. He agreed with the suggestion that he lands long, speeds up the landing roll, and does not shut down the engine. The cargo consignee approaches the aircraft, offloads the cargo and the aircraft takes off. He also stated that another pilot had advised him not to continue operating in this manner as it was very dangerous.

He insisted that the parked aircraft was a hazard and he would not have hit it if it was not parked in that position. It was pointed out to him that if he had done a normal landing, he would not have hit the aircraft. While he agreed that, with the speed of the aircraft he would have run off the runway, he did not believe that he would have ended up in the river. He also reiterated that there was a problem with the brakes. He stated that because only the right brake was working this would account for the aircraft pulling to the right when he applied brakes.

On request, the pilot submitted his Personal Flying Log Book and his Pilot Licence. The licence was untidy and the current validity slip of the licence was not presented. Inspection of his log book revealed that it was not correctly completed. There were no running totals, so it was difficult to determine his total hours. The takeoff and landing times for the flights recorded were not entered. Two pages of the log book were pasted together, thus the information on these pages were not available to the team. The pilot said that he had made a mistake on those pages. From the logbook, it was also noted that the pilot had flown for nine consecutive days from 4<sup>th</sup> November to 12<sup>th</sup> November 2015, the day of the accident.

#### **1.18.5 ATC Information**

In a telephone interview with the Duty Air Traffic Controller, he advised that the pilot reported closing his flight plan and also advised that he had finished operations for the day, but no report was made about the accident.

The difficulty in properly assessing the information in the pilot's log book necessitated a request to the Air Navigation Services Directorate (ANSD) of GCAA for the list of flights conducted by the pilot for the one-month period prior to the accident flight.

#### **1.18.6 Interview with Company Representatives**

After several attempts, three company officials made themselves available for interviews with the Accident Investigation Team. Company officials who attended the interview were the General Manager, the Operations Manager and the Pilot. Several issues in the 'Factual Information' section of the report were discussed with the company representatives.

The company disputed that the pilot would have flown for nine consecutive days and promised to present their booking/reservations or other records to support their claim. To date this has not been done.

The Operations Manager attempted to explain why the company allowed the pilot to fly for six weeks without a valid licence. His explanation was not acceptable.

With regard to the position of Chief Pilot in the company, the Operations Manager claimed that after the first Chief Pilot was no longer in the employ of the company, the owner was given approval to fill the position temporarily. He was requested to provide the substantiating correspondence, but this was not done. The Operations Manager also stated that GCAA had given approval for the accident pilot to hold the position of chief pilot. There is no proof of this.

It was also noted that the company utilises freelance pilots to do flying that cannot be done by its full-time pilot. The Operations Manager stated that the freelance pilots keep their own records and would advise the company of their availability or otherwise if a request was made to them.

The company representatives were told that the company was also operating without a Safety Officer at the time of the accident. This too was disputed by the company. It was claimed by the company that the owner was given approval by the GCAA to act as the Safety Officer. However, this approval was for a limited period which expired on 29<sup>th</sup> October 2015. Thus, in effect the company was operating without a Chief Pilot and without a Safety Officer at the time of the accident.

## **2. Analysis**

### **2.1. The Pilot**

The pilot is a 24-year-old male who was certified in accordance with the Guyana Civil Aviation Regulations. His Guyana CPL #332 was issued based on his South African CPL #0272305079 that was issued on 11<sup>th</sup> April 2013. As required, he completed the 200hrs observer flying time and the Guyana Air Law examination. His Guyana CPL#332 was issued on 15<sup>th</sup> April 2015 and expired on 30<sup>th</sup> September 2015. He is the company's only full-time pilot.

Although the pilot had completed the required Guyana Class 1 medical on 29<sup>th</sup> September 2015, to renew his licence, his licence was not valid at the time of the accident because he failed to submit the Application for Renewal Form, as required by GARs IS 2.2.1(e). Further he was also in violation of Guyana Civil Aviation (Air Navigation) Regulation 2001 (GCARs) paragraph 26(5) which prohibits a licence holder from performing the functions of his licence, unless the licence bears a certificate of validity. By flying as pilot in command without a valid licence, he also violated GARs 2.3.1.3(a), which prohibits a person from acting as a flight crew member unless a valid licence is held. His last Aircraft Proficiency Check was successfully done on 4<sup>th</sup> November 2015.

The pilot's method of recording his flight time is not in keeping with GCARs paragraph 28(2) which requires the recording of each flight, as a flight crew member .... at the end of each flight or as soon as possible thereafter. He also breached GARs IS 2.2.8. which, among other things, requires that the place and time of departure and arrival must be logged. He also did not bring forward the total hours from his previous log book to the current log book to provide a continuous running total. Thus, his total flight time could not be accurately determined. By pasting two pages of his log book together the pilot breached GCARS paragraph 78(2) which makes it an offence to intentionally damage, alter or render illegible any log book or other record. This was also a violation of GARs 1.2.5(a) which prohibits disfigurement of legal documents.

The pilot's general handling of his licence and log book shows scant regard for the importance of these documents.



When the pilot reported landing and completion of the day's activities to ATC, but failed to report the accident, he violated GARs 8.5.1.23(b), which requires the pilot-in-command to report an accident by the quickest means available to the Authority.

The pilot's unauthorized installation of the Go-Pro camera was both illegal and dangerous. The fact that he installed it on the left wing leading edge and near to the pitot tube is cause for concern, as it questions his understanding of aircraft instruments systems. He is also in breach of GARs 5.5.3(a) which prohibits anyone from performing unauthorized modifications to any aircraft. He failed to recognize the adverse effects that could result from disturbed airflow over the aircraft wing and its possible effects on the aerodynamics of the aircraft operations. He also failed to recognize that even partial blockage of the pitot tube could adversely affect the readings of the static instruments in the aircraft including the airspeed indicator and the altimeter. This therefore means that he also violated GCARs paragraph 28(6), which states that equipment shall be installed so as not to be a source of danger .... or to impair the proper functioning of any equipment .... necessary for safe functioning of the aircraft. It was noted that the pilot was just four years out of flight school and his failure to recognize the danger of disturbing the RAM airflow is not acceptable. He was urged to continuously review his training manuals in order to ensure that his knowledge remained up to date.

It was determined that the pilot's limited experience prevented him from correctly judging the true airspeed of the aircraft. He may have also misjudged the height and descent rate of the aircraft, contributing to the high and fast approach on both flights that day. The fact that he did not correctly assess what was happening outside the aircraft caused the situation to escalate.

When the pilot stated that the aircraft touched down well before the windsock, it raised the question of his situational awareness. Eyewitness accounts, evidence on the ground, and actual measurements confirm the landing was more than halfway down the runway. If the pilot had full situational awareness, he would have opted to execute a go-around well before touching down. Rather, it appears that he opted to cut the power and pushed the nose down to land. Pushing the nose down would have increased the speed of the aircraft which was already too fast on the approach to a short airstrip.

The similarity of the two landings raised the possibility that the pilot's normal modus operandi was to land long and fast to minimize his ground time. This is an extremely dangerous practice especially considering that Ekereku Bottom is a very short airstrip and the aircraft's landing roll would have been additionally influenced by the wind, elevation and temperature at the airstrip.

The pilot's general attitude, and reports pertaining to his mode of dress and manner of operation generally, suggests a careless attitude to flying. This is supported by his own statement that he is able to land, discharge his cargo and takeoff within one to two minutes. This suggests that the engine and propeller continue to operate while offloading and loading is being done. Further, this is compounded by the fact that loading and offloading is done by untrained persons who are also expected to close and lock the aircraft door prior to it taking off.

The short duration of his turnaround time also raises the question of how securely the cargo was strapped, as under normal circumstances it should take more time to loosen four straps each from two drums and get them out of the aircraft.

He was urged to be more careful and cautious. He was reminded that he operates in a difficult environment in which unsafe operations could be unforgiving.

## **2.2. The Aircraft**

### **2.2.1. Maintenance**

The aircraft has a Certificate of Airworthiness which was valid until 15<sup>th</sup> December 2015. 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. Checks of the aircraft brakes show that they were functioning satisfactorily. It was also noted that after bleeding the brakes at Eteringbang, a ground run before taking off should have picked up any braking problem. Further although the pilot insisted that the brakes were intermittent, there was no entry in the aircraft technical log book with regard to the claimed malfunctioning of the brakes. This is in breach of GARs 8.5.1.19 which requires the pilot in command to ensure that mechanical irregularities occurring during flight time are entered in the aircraft technical log book. This is also a violation of GCARs paragraph 12(2)(b).

### **2.2.2. The Landing Configuration**

The pilot made the approach to landing high and fast and touched down more than half way down the airstrip. With a measured runway length of 1623ft, at best, the aircraft had just over 600ft to come to a complete stop on the runway. The Cessna Super Sky Wagon Owner's Manual indicates a required landing ground roll of approximately 830ft at 2000ft pressure altitude and a temperature of 30°C. It should be noted, bearing in mind the length of the airstrip, that this assumes use of the short field technique, which requires heavy braking as recommended by the manufacturer of the aircraft. Stopping an aircraft after landing more than half way down a short runway at high speed could prove to be extremely challenging for an inexperienced pilot.

When the pilot stated that the approach speed was 60kts on the approach, it may have been much faster. The RAM airflow through the pitot tube was disturbed by the presence of the camera and the materials used to attach it near to the pitot tube and this would have distorted the airspeed indicator reading.

The aircraft was not stabilized for the approach as it was high and fast. By the time of touchdown, the aircraft was already inclined to the right of the runway center line. On touch down it veered further right and with the right wheel off the runway, rudder control was negligible. It was also determined that with the right wheel on the grass and sand shoulder of the runway, attempts to steer the aircraft with the rudder would not have been as effective as it should be. In these circumstances, the collision with the parked aircraft was unavoidable.

The impact with the stationary Cessna 172 aircraft slowed the active aircraft, which continued to roll for another 175ft. The possibility of greater damage, with the likelihood of a possible tragic outcome cannot be ruled out.

### **2.3. The Airstrip**

The airstrip does not have any marks that would aid the pilot operating there. The only visual aid is the wind sock. Insertion of a modified runway center line, threshold and edge markings would enhance operations at the airstrip.

A police station is located near to the airstrip. Normally at least one officer is present on the airstrip for every flight. Arrangements should be put in place to ensure that the immediate environs of the airstrip are kept free of obstacles.

Historically this airstrip is considered to be quite difficult to operate into, however it has been improved in recent years. Nevertheless, pilots operating into this airstrip should acquire as much experience as possible, with an experienced pilot, before being allowed to operate into it as pilot in command.

#### **2.4. The Operator**

Oxford Aviation Inc. is the holder of an Air Operator Certificate issued by the GCAA in 2012. The company is also an Approved Maintenance Organisation. The company indicated to its approved Chief Pilot that the accident pilot had been appointed to the position of Chief Pilot. This caused the approved Chief Pilot to leave the job effective 20<sup>th</sup> September 2015. The nomination of the accident pilot to the position of chief pilot was rejected by the GCAA because the nominee did not have the minimum requirements for the post. Nevertheless, the company represented to the investigation that the accident pilot is its Chief Pilot. Given the duties and responsibilities of the Chief Pilot, the accident pilot is not a suitable candidate for this position.

Upon request by the company, the GCAA had given approval for the owner to hold the position of Safety Officer effective for one month up to 29<sup>th</sup> October 2015. This expiration date was two weeks prior to the accident. No other nominee had been proposed by the company.

Thus, at the time of the accident, the company had neither a Chief Pilot nor a Safety Officer. In keeping with GARs IS 9.2.2.2, these are required management personnel positions for commercial air transport operations. Both post holders are expected to fulfill responsibilities that are vital to continued safe operations of the company. In the absence of these two approved positions the company's operations should have been suspended.

From its inception, this company had difficulty recruiting locally trained skilled pilots. It resorted to recruiting foreign licensed pilots, who regardless of their qualifications and experience are required to acquire a minimum of 200hrs flying time outside a radius of



75 nautical miles from the Cheddi Jagan International Airport, Timehri, with a qualified pilot, before operating as pilot-in-command in Guyana's hinterland. This requirement is stated in the GARs Part 8 – 8.10.1.30(d). Guyana's hinterland is considered to be particularly treacherous for pilots who are inexperienced in this area.

A review of the pilot's log book shows that the accident flight occurred on the ninth day of consecutive flying. This is a violation of GARs 8.11.1.3(e) which mandates that the AOC holder shall relieve flight crew of all duties for 24 consecutive hours during any seven consecutive day period. This was also in breach of the company's flight and duty time limitations as contained in the company's General Operations Manual section 7.2.2 which states that pilots will have a rest day on the 7<sup>th</sup> day of a work week.

The company violated GCARs paragraph 63(3) by its use of free-lance pilots without ensuring that it had in its possession accurate and up-to-date records of each free-lance pilot used by the company.

The system used by the company to ensure that its pilots' licences are valid before scheduling them to operate is not effective. This pilot flew for almost six weeks without a valid pilot's licence.

As outlined in the company's General Operations Manual, the duties of the Operations Superintendent are quite complex. The training records presented for the individual identified as the Operations Superintendent show that this individual has not received training in keeping with the training syllabus contained in the company's General Operations Manual.

Although there is no approved position of Operations Manager listed in the company's General Operations Manual, from discussions with the company representatives, it is obvious that the individual identified as the Operations Manager supervises the Operations Superintendent. No training records were presented for the Operations Manager but given his role in the operations of this company, he can benefit from a flight dispatcher's course.

The use of the cargo consignee to offload/load the aircraft while its engine is still running is an unsafe practice. These individuals are not company employees and would not have been subjected to the company's safety training. The company needs to ensure



that trained staff are put in place at all airstrips in use during shuttle operations. In the absence of trained staff or other crew, the pilot must personally supervise the loading/offloading of cargo and passengers.

Further it is the pilot's responsibility to ensure that prior to each flight a preflight inspection of the aircraft is done, to satisfy himself that the aircraft is airworthy. The pilot did not carry out this procedure. The accident flight was a single crew operation and would require the pilot to shut down the aircraft and physically do a post flight inspection around the aircraft to satisfy this requirement.

Generally, this company's operation reflects disregard for the Authority. It also reflects lack of adequate oversight by the Authority, as there was failure to ensure that this company met the basic requirements that are necessary for its safe day to day operations.

## **2.5. The Parked Aircraft**

In relation to the parked aircraft, there is no regulation that stipulates the distance that an aircraft should be parked from the edge of an active runway in Guyana's hinterland. It is therefore incumbent on a pilot, or person parking an aircraft, to exercise good judgment and to recognise that imprudent parking of an aircraft may result in a possible obstruction or encumbrance which may impede safe aircraft operations at an airstrip.

## **2.6 The GCAA**

### **2.6.1. General**

The absence of a resident Flight Operations Inspector in the Authority has hampered its ability to provide adequate oversight of aircraft operators, consequently this has allowed operators such as Oxford Aviation Inc. to continue operating without the required management personnel.

The untidy condition of the pilot's licence and his unacceptable method of keeping his flight records in his personal log book indicate his cavalier attitude to a challenging profession and scant regard for the Authority. The pilot should be given a stern warning by the GCAA to desist from this and to ensure that these legal records are properly maintained.



### **2.6.2. The AIP**

The system to ensure that information in the Guyana AIP meets requirements for accuracy is not effective. The published length and width of the airstrip of 1801ft and 49ft respectively, as stated in the Guyana AIP are incorrect. This inaccurate information may result in misleading calculations and contribute to unsafe aircraft operations. The measured length of the Ekereku Bottom airstrip is 1623ft and width is 41ft. This information must be urgently corrected by the GCAA.

### **2.6.3. Aircraft Movements**

The information provided by the Aeronautical Information Service on flights done by the pilot was unsatisfactory and of little help to the investigation. The information was not recorded in chronological order and in several cases, there were obvious inaccuracies in the recorded times. These records may give a general indication of the pilots flying hours and could also be used for confirmation of aircraft hours so as to ensure that maintenance checks, as required by law, are done on schedule. Additionally, this information is used to determine revenue and must be carefully handled. This reflects inadequate supervision.

### **3. Conclusion**

#### **3.1 Cause**

The probable cause of this accident was an unstabilised approach which resulted in the aircraft touching down long, fast and far right of the runway centerline on a short airstrip. After landing, it veered further right at high speed and came into contact with the parked aircraft.

#### **3.2 Contributory Factors**

1. The unauthorized installation of the Go-Pro camera may have adversely affected functioning of the pitot/static instruments in the cockpit.
2. The pilot's lack of experience which may have prevented him from being able to correctly assess the speed and height of the aircraft during the landing phase.

#### **3.3 Findings**

##### **3.3.1. The Pilot**

1. The pilot's licence was invalid.
2. The pilot made an unapproved modification to the aircraft.
3. The pilot displayed poor/limited knowledge of aircraft systems.
4. The pilot demonstrated poor situational awareness.
5. The pilot's operation of the aircraft during the accident flight and the previous flight bordered on recklessness.
6. The pilot failed to observe the required flight and duty times as prescribed by law.
7. The pilot failed to report the accident to the GCAA by the quickest means available.

##### **3.3.2. The Company**

1. The company holds an Air Operator Certificate.
2. The company was operating without an approved Chief Pilot and without a Safety Manager.
3. The company's training records for ground staff are not properly maintained.

4. Records provided by the company show that it has not provided adequate training for its ground staff.
5. The company's flying records are not properly tracked and maintained; it allowed the pilot to fly for six weeks with an invalid licence.
6. The pilot's required rest, flight and duty times were not adhered to by the company.
7. The company does not keep current records of free-lance pilots who fly for it.
8. The company allowed untrained persons to offload cargo from its aircraft while its engine was running.
9. The company does not have a dress code that requires pilots to be properly attired for all flights.
10. The company holds an Approved Maintenance Organisation Certificate and does all of its own maintenance.
11. The Company does not have a written preflight checklist for use by its mechanics.
12. Attempts were made by the company to commence repairs to the accident aircraft without approval by the Authority.

### **3.3.3. The Aircraft**

1. The aircraft was properly certified.
2. Maintenance records indicate that the aircraft was properly maintained.
3. The aircraft brakes were functioning satisfactorily.
4. The aircraft was not stabilized on approach prior to landing.
5. The aircraft landing speed was excessive.
6. The unauthorized installation of the Go-Pro camera may have adversely affected functioning of the pitot/static instruments. This could have caused erroneous readings on the aircraft flight instruments.

### **3.3.4. The Weather**

The weather at the airstrip was VMC, however there was adverse weather including showers, in several sectors around the airstrip, which may have had an adverse effect on the landing speeds.

### **3.3.5 The GCAA**

1. The dire shortage of senior technical staff in the Authority hampers its efficiency and professionalism.
  - a. The Authority is not providing adequate oversight for aircraft operators including this company.
  - b. The GCAA does not have a procedure for inspection of pilots' records.
  - c. There is need for greater supervision of the work in the ATC facilities and the AIS.
  - d. Some information recorded in the Guyana AIP is inaccurate.
  - e. The compilation of information on aircraft movements is inaccurate.

## **4. Safety Recommendations**

### **4.1 The Company**

1. Company operations should be suspended pending a review by the Authority for the following reasons:
  - a. The company should not be allowed to continue operating without the required post holders, e.g. Chief Pilot and Safety Officer.
  - b. The company should establish and maintain proper training records for all staff.
  - c. The company should ensure that pilots' licences are tracked to ensure validity before allowing pilots to fly.
  - d. The company should keep current and accurate records of all pilots who are required to fly for it.
  - e. The company should provide its own trained staff to supervise loading and unloading of aircraft at hinterland airstrips. Alternatively, the pilot must personally supervise the loading/offloading of cargo and passengers.
2. The company should establish and enforce a dress code to ensure that pilots are properly attired for all flights.
3. The company should provide a written preflight checklist for use by mechanics.
4. The company should be reminded that repairs to accident aircraft should not commence until so advised and approved by the Authority.
5. The company should acquire suitable training for its ground staff, this includes a flight dispatcher's course for the person functioning as its Operations Superintendent.

### **4.2. The Pilot**

The pilot should be required to satisfactorily complete the following areas before resuming flying;

1. Theory of Flight with special emphasis on;
  - a. Aerodynamics and the effects of interference of airflow over wing surfaces.

- b. Pitot-static systems and instruments and errors that can result from incorrect pressure sensation, caused by disturbed airflow around the pitot head and/or static vents.
  - c. Weather with emphasis on thunderstorms over and around airports and the effect of wind shear on takeoff and landings.
  - d. Aircraft Performance with emphasis on landing techniques, including landing at short runways, operations at uncontrolled airstrips, the effects of tail wind on landing and braking techniques.
2. Crew Resource Management with emphasis on single crew operations. This must include airmanship, attitude and the importance of self-discipline, situational awareness, problem solving and decision making.
  3. Review of the Guyana Aviation Requirements to:
    - a. Instill the requirements related to renewal of pilots' licences and completion of personal log book entries.
    - b. The necessity of reporting accidents to the proper authority in a timely manner.
  4. The pilot should also be required to satisfactorily complete the following practical exercises:
    - a. At least six short field landings under the supervision of an approved senior pilot.
    - b. Recheck at Ekereku Bottom and all airstrips less than 2000ft in length before being allowed to operate into them as pilot in command.

#### **4.3. The GCAA**

1. The Authority should urgently obtain the services of a full-time resident flight operations inspector.
2. The Authority should ensure that holders of Guyana Air Operator Certificates have the required management staff to function effectively.
3. The Authority should conduct a review of the Guyana AIP to ensure that the information contained therein is accurate. The AIP must be regularly updated and amended.



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4. ATS staff should ensure that all aircraft movements are recorded on flight progress strips. This would ensure that compilation of aircraft movements, for billing purposes and record keeping, by the AIS reflect greater accuracy.
5. Supervision of the work in the AIS and Air Traffic Services units needs to be enhanced.
6. Companies should be required to submit flight and duty times records to the Authority to facilitate correlation of the times flown by free-lance pilots.



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