



AIRCRAFT ACCIDENT REPORT

Cessna 208 Caravan: Registration – 8R-GAB

At Matthews Ridge Airstrip Region No. 1 Guyana

07 29 13.30N 060 11.17.10W

9th January, 2015.

REPORT # GCAA: 2/5/1/78

This report represents the conclusions reached by the Guyana Aircraft Accident Investigation Team on the circumstances surrounding the aircraft accident, involving Guyana registered aircraft – Cessna 208, 8R-GAB.

This investigation was done in accordance with Annex 13 to the Convention on International Civil Aviation. The investigation is intended neither to apportion blame, nor 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.



Contents

ABBREVIATIONS and GLOSSARY.....	4
SYNOPSIS	6
1. FACTUAL INFORMATION.....	7
1.1. History of the Flight	7
1.2. Injuries to Persons.....	7
1.3. Damage to Aircraft.....	8
1.4. Other Damage.....	8
1.5. Personnel Information	8
1.5.1. Flight Crew	8
1.6. Aircraft Information	9
1.6.1. General.....	9
1.6.2. Maintenance.....	9
1.6.3. Mass and Balance.....	10
1.7. Meteorological Information.....	10
1.8. Aids to Navigation.....	10
1.9. Communications	10
1.10. Aerodrome Information.....	11
1.11. Flight Recorders	11
1.12. Wreckage Information	11
1.13. Medical and Pathological Information.....	12
1.14. Fire	12
1.15. Survival Aspects	12
1.16. Tests and Research	12
1.17. The Organization.....	12
1.17.1. General.....	12
1.17.2. Maintenance	13
1.18. Other Information.....	13
1.18.1. General.....	13
2.0. ANALYSIS.....	15
2.1. The Pilot	15
2.2. The Aircraft	16
2.3. The Company	16



2.4. Meteorological Information.....	16
2.5. The Aerodrome.....	17
3.0. CONCLUSION.....	18
3.1. Cause.....	18
3.2. Contributory Causes.....	18
3.3. Findings.....	18
4. Recommendations.....	20
5. Actions Taken since the Accident.....	21



ABBREVIATIONS and GLOSSARY

AIP -	Aeronautical Information Publication – A publication issued by or with the authority of a State, containing aeronautical information of a lasting character essential to air navigation. It is designed to be a manual containing thorough details of regulations, procedures and other information pertinent to flying aircraft in the particular country to which it relates. It is usually issued by or on behalf of the respective civil aviation administration. (ICAO Definition)
AMEL –	Aircraft Maintenance Engineer Licence
AMO –	Approved Maintenance Organization
AMSL -	Above Mean Sea Level (elevation)
AOC -	Air Operator Certificate
APC –	Aircraft Proficiency Check
ATS -	Air Traffic Services
CPL -	Commercial Pilot Licence
DG -	Dangerous Goods
GCAA –	Guyana Civil Aviation Authority
HF –	High Frequency
IAW -	In accordance with
ICAO –	International Civil Aviation Organization
IPC -	Instrument Proficiency Check
MEL -	Minimum Equipment List
METAR -	Meteorological Aerodrome Report (Weather information reporting format)



MSA -	Minimum Safety Altitude
PIC –	Pilot in Command
Rate one Turn -	A turn made at 3° per second, thus a 360° turn is completed in 2 minutes.
RWY -	Runway
S/N –	Serial Number
SOPs –	Standard Operating Procedures
TAF -	Terminal Area Forecast
TGAL -	Trans Guyana Airways Limited
TSO -	Time since overhaul
UTC –	Coordinated Universal Time
VFR –	Visual Flight Rules



SYNOPSIS

On 9th January, 2015 Trans Guyana Airways flight TGA103A, a Cessna 208B Caravan aircraft, Registration 8R-GAB, departed Ogle International Airport at 12:35hrs UTC for Matthews Ridge Airstrip, location 07 29 13.30N 060 11 17.10W, with one crew and twelve passengers and two infants on board. The flight also had cargo and Dangerous Goods, consisting of three tins of paint on board. The flight to Matthews Ridge was uneventful until the final approach to land. The aircraft approached the runway from the left and had to make a steep bank in an attempt to establish on the runway centerline. The aircraft was slow in the turn and was possibly further slowed by the steep bank causing the aircraft to exhibit the characteristics of an imminent accelerated stall. This forced the aircraft's rate of sink to increase and the pilot was unable to stabilize the aircraft's approach. The aircraft's port wing touched the ground first, followed by the port undercarriage. There were no injuries or fatalities.



1. FACTUAL INFORMATION

1.1. History of the Flight

Departure of the flight was delayed for approximately 1½hrs due to bad weather at the destination aerodrome, Matthews Ridge. When what was considered to be an improved weather report was received, the aircraft departed Ogle International Airport at 12:35hrs UTC. The flight was uneventful until just before landing. The accident pilot was advised by another company pilot, who had landed at Matthews Ridge a few minutes earlier, that the weather on the approach to RWY 28, from over the Matthews Ridge Village was satisfactory. However the accident pilot reported that when he arrived, the village was not visible as there were heavy clouds over that area.

It is apparent that the pilot was not sure where he was and found himself on short left base RWY28, from which position he opted to make a steep turn onto the runway. He had slowed the aircraft down and the steep turn further slowed the aircraft resulting in an imminent accelerated stall. The aircraft touched the ground in a steep bank attitude and the left wing of the aircraft made contact with the ground before the wheels of the landing gears.

The accident occurred during mid-morning. There were no injuries or fatalities.

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	14 (12 adults + 2 infants)	0	15
Total	1	14	0	15



1.3. Damage to Aircraft

Damage to the aircraft was restricted to the port wing and port undercarriage.

1.4. Other Damage

There was no other damage.

1.5. Personnel Information

1.5.1. Flight Crew

Pilot Licence	Guyana CPL #297
Aircraft Ratings	Single Engine Land; Multi Engine Land
Type Ratings	Cessna 172; Cessna 208
Date of Birth/Age	10 th October, 1992. /22 years
Type of Medical	1 st Class
Medical Expiry Date	31 st January, 2015.
Total Flying Hours	2396:00hrs
Hours on Type	1200.00hrs approx.
Hours in Command on Type	750hrs approx.
Duty in Last 7 days	6:00hrs
Duty in last 24 hours	0hrs
Last APC/IPC	30 th December, 2014

The pilot obtained his Guyana CPL#297 on 19th January, 2011 and achieved command on the Cessna 208 on 28th December, 2013 and has since acquired 750hrs in command in the Cessna 208B. He completed his last medical on the 29th July, 2014. He has no medical limitations. The record of his flight and duty times are within acceptable limits. Training records indicate that the



Captain had received the standard company training for the aircraft type. This included ground, simulator and flight training. The pilot also completed the regularly scheduled Proficiency Checks, which are standard regulatory and company requirements.

1.6. Aircraft Information

1.6.1. General

Manufacturer	Cessna Aircraft Company
Aircraft Registration	8R-GAB
Type and Model	Cessna 208B
Year of Manufacture	2004
Serial Number	1070
Certificate of Airworthiness	Issued 19 th January, 2011
Total Airframe Time	13,488:08hrs
Next Inspection	due 16 th January 2015
No. and Type of Engine	One/ PT6A-114A
Engine Serial Number	PCE-PC-1352
Total Engine Time	5732:39hrs
Engine TSO	NA
Maximum Allowable Take Off Weight	9062lbs
Maximum Allowable Landing Weight	9000lbs
Fuel Type	Av Jet A1

This aircraft was acquired by Trans Guyana Airways and was entered on the Guyana Civil Aircraft Register 19th January, 2011.

1.6.2. Maintenance

Examination of the aircraft maintenance records indicate 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. Total airframe time on the aircraft prior to the accident was 13,488:08hrs. Total engine time was 5732:39hrs.



1.6.3. Mass and Balance

The aircraft was dispatched with fourteen passengers, with a total weight of 1979lbs and their personal baggage weighing 154lbs. There was also 518lbs of cargo on board. The total payload was 2651lbs and the takeoff weight was 9062lbs.

1.7. Meteorological Information

This accident occurred in daylight. There is no observation or recording station in the vicinity of the accident aerodrome. The company depends on layman weather observations from untrained persons at the destination aerodrome. Prior to departure from base the weather provided from personnel on the ground at Matthews Ridge indicated “85% light rain in and out, clearing”. This weather was recorded on the Operational Flight Plan which was signed by the pilot.

The Hydrometeorological Division of the Ministry of Agriculture provides meteorological services for civil aviation operations through the National Weather Watch Center at Cheddi Jagan International Airport and Ogle International Airport. Services provided include personal briefing and consultation for flight crew and flight documentation for domestic flights on request; including a significant weather chart, upper wind and upper air temperature charts, and the latest METAR and TAFS for destination and alternate aerodromes.¹

1.8. Aids to Navigation

There are no aids to navigation in the area.

1.9. Communications

The frequencies available for communications between Air Traffic Services (ATS) and the aircraft are; 124.2MHz, 130.125MHz and 6735.5KHz. There were no reported malfunctions of

¹ Information from the Guyana AIP, pg. GEN 3.5-5 dated 04 APR 13.



the aircraft or ATS communications systems at the time. The aircraft reported landing to the company radio room about three minutes before touchdown.

1.10. Aerodrome Information

This accident occurred at Matthews Ridge Airstrip, location 07 29 13.30N 060 11 17.10W, in Region #1 Guyana. Information in the Guyana Aeronautical Information Publication (AIP) shows that the airstrip is 4800ft long and 66ft wide, elevation 250ft, orientation 08/26.

The surface of the airstrip is made of manganese tailings and is relatively smooth and level. It is an uncontrolled VFR airstrip, equipped with a windsock located at the western end of the runway, on the left side of the threshold. Orange marker cones are located approximately 1600ft from the beginning of eastern end of the runway.

The airstrip is managed and maintained by the Ministry of Public Works and is inspected and licensed by the Guyana Civil Aviation Authority. The aerodrome licence is valid until 13th July, 2015.

1.11. Flight Recorders

The aircraft is not required to be equipped with flight recorders.

1.12. Wreckage Information

The port wing and port landing gear of the aircraft were damaged. The port wing tip was bent upwards from the fourth under surface panel. A preliminary inspection shows that damage to the port wing included damage to the bottom of the wing tip fairing due to ground contact; the top skin was wrinkled; front spar top boom cracked and wrinkled; the port navigation and strobe lights were broken and front spar web was wrinkled. The port main wheel showed signs of toe-in at the top.



1.13. Medical and Pathological Information

The pilot was not subjected to any medical tests.

1.14. Fire

There was no fire.

1.15. Survival Aspects

The aircraft approached the runway in an abnormal attitude and touched down right of the center line, 857ft before the cones on RWY28. Damage to the aircraft was restricted to the left wing and left undercarriage. Seats, seat belts and harnesses were intact and functioned properly. There were no injuries or fatalities.

1.16. Tests and Research

No tests or research were carried out.

1.17. The Organization

1.17.1. General

Trans Guyana Airways Limited (TGAL) is a member company of the M.C. Correia Holdings Group of Companies and is one of the most experienced aircraft operators in Guyana. Initially aircraft operations started in the 1950's in support of the owner's mining and other operations in Guyana's hinterland. By the 1980s, TGAL came into being and eventually grew into a full-fledged commercial aircraft operator doing domestic and international, scheduled and charter operations. The company's main base is at Ogle International Airport. The company's entire fleet is made up of six Cessna 208B Caravan aircraft.



The management structure includes the Accountable Manager, the Director of Operations, the Chief Pilot and the Safety Manager. The Chief Pilot reports to the Director of Operations and is responsible for ensuring that all TGAL pilots and other flight crew are trained and checked to ensure safe and efficient flight operations for the company.

The company's Flight Operations Manual lists the training required for the C208 pilot. Training includes 18 hours of initial ground school, which covers the aircraft systems; 25 hours of observer familiarization; briefing, which includes mass and balance, aircraft performance and various emergency procedures and malfunctions; 5 hours of flight training, which include stalls and steep turns; the aircraft type technical examination and flight check; and 25 hours of line training and airstrip check. There is provision for de-briefs after each phase and additional training in each phase as may be required by the individual trainee pilot.²

Additionally the pilot is required to achieve 1000hrs, which includes 250hrs as pilot in command under supervision, before being allowed to fly as pilot in command.

1.17.2. Maintenance

Maintenance for the aircraft operator is carried out by Caribbean Aviation Maintenance Services Ltd (CAMSL) which is a sister company of the Aircraft Operator, TGAL. The two companies share the same Accountable Manager. The AMO is suitably staffed and equipped to effectively carry out the tasks it undertakes and utilizes the AMEL system as the basis for maintenance certification.

1.18. Other Information

1.18.1. General

The company had scheduled two flights for early morning departure from its base at Ogle International Airport to Matthews Ridge. Both flights were delayed for approximately 1½hrs due to bad weather at the destination. The accident aircraft was the second one to depart and left four minutes after the first one.

² TGAL Flight Operations Manual, Rev.6 Vol.4 Pg. 6 of 26 to Pg. 13 of 26



The pilot of the first aircraft reported that he got into Matthews Ridge quite easily and the weather there was just as reported. This pilot advised the accident aircraft that the village which is on the approach for RWY28 was open with good visibility. Shortly after he noticed that the accident aircraft was coming in at an unusual angle, almost a 90° bank and very low over the trees. The aircraft contacted the ground in a bank striking the port wing and the port landing gear. It appeared that the pilot had lost total control of the aircraft and seemed to be heading for the high ground on the right of the runway. At the last moment it seemed that the pilot regained control and landed and taxied the aircraft as per normal and parked the aircraft.

The accident pilot reported that he did receive the advice from the pilot on the ground, but the village was not visible to him. He found an opening in the clouds and descended below the cloud base which he estimated to be 500ft AMSL. He identified an area on the ground which confirmed that he was in the vicinity of the runway. He reduced power and put in full flaps for the landing configuration and turned onto the runway. He stated that although it was not a rate one turn, it was not as steep as 45°. In the turn he felt some buffeting and thought it may have been a quartering tail wind. While also in the turn he recognized that although he was seeing the 'aiming spot', he knew that the aircraft would not make the intended touchdown point as it was bleeding off speed too quickly. He further stated that with the full load, the slow speed and the high ground ahead, it would not be wise to attempt a go-around. The buffeting also became more pronounced and he realized that any attempt to flare would result in the aircraft stalling. When questioned he stated that he did not hear the stall warning horn at any time.

During the interviews the pilot showed some hesitancy in displaying knowledge which is considered essential for safe aircraft operations especially given the difficult terrain and the capricious weather conditions that prevail in Guyana. This raised the question of the adequacy of the pilot's basic flight school training and his ability to respond to the demands and challenges of being a pilot in command.



2.0. ANALYSIS

2.1. The Pilot

The pilot is 22 years old. He obtained his CPL #297 in 2011 and became a command pilot on the Cessna 208 Caravan in December 2013. There are no limitations on his Class 1 medical which is valid until 31st January, 2015. There was no evidence of any pre-existing medical or behavioural conditions which may have adversely affected the pilot's performance during this flight.

Training records show that all required training was successfully completed. He has 2396:00hrs total flying time and approximately 1200hrs on the Caravan, with 750hrs being command time. His last Aircraft Proficiency Check (APC/IPC) was successfully done on aircraft type on 30th December, 2014. The next check was due in July 2015. Route and airstrip checks were regularly done. His last Route and Airstrip Check to Matthews Ridge was done on 16th April, 2014 and the next check is due on 1st May, 2015. He was qualified and experienced to conduct the flight.

The pilot displayed very poor decision making. Firstly, when he departed after receiving a weather report that indicated bad weather at the destination; and secondly when he descended below the area Minimum Safe Altitude (MSA) of 3000ft while in cloud and without visual contact with the ground. When he emerged from the clouds he was at 500ft AMSL. The elevation at Matthews Ridge is 250ft AMSL. Thus he was in fact just 250ft above the ground and may have been just over tall tree tops in the area. This was confirmed by a pilot who was on the ground at that time.

The pilot's situational awareness may not have been at its best during the approach and landing, as it is apparent that the pilot was unsure of the aircraft's position. He slowed the aircraft and prepared it for landing, but did not realize that he was so close to the runway. When he spotted the runway, he made an abrupt and steep turn in an attempt to get to the touchdown point. The buffeting experienced during the turn were the signs of an incipient accelerated stall which caused the aircraft to increase its sink rate. The pilot had no control of the aircraft and was therefore unable to correct the aircraft's attitude and flight path, resulting in the aircraft's port wing tip making the first contact with the ground.



No explanation was given for the pilot not hearing the stall warning horn. A subsequent check showed that this device was functioning satisfactorily.

2.2. The Aircraft

Maintenance records show that the aircraft was maintained IAW established procedures. The aircraft's Certificate of Airworthiness was due for renewal on 19th January, 2015, one week after the accident. The aircraft was already prepared for this renewal and the associated documents were in the possession of the GCAA Airworthiness Inspector. All records were inspected and found to be satisfactory. There was no mechanical problem that could have contributed to this accident.

The aircraft was properly loaded.

2.3. The Company

The senior technical staff were found to be qualified and skilled for their various portfolios. The company's Director of Operations recently retired, this resulted in internal promotions. The new Director of Operations and the Chief Pilot work well together and along with the Safety Manager are very amenable to advice and guidance given by the accident investigation team.

2.4. Meteorological Information

Weather conditions at the destination were reported by a lay person. This individual reported the weather as being "85%, light rain in and out, clearing." This is interpreted as 85% cloud coverage with rain moving in waves across the area, which was reportedly an improvement from 1½hrs earlier. This weather report is very inadequate as it lacked information on the height of the cloud base, type of low level clouds, visibility, wind speed and direction. It did not provide all information necessary to help the pilot to make the go/no go decision.

The fact that this report was recorded on the Operational Flight Plan, which was signed by the pilot indicates that this type of weather reporting is acceptable to the company.



The National Weather Watch Center has a branch office at the company's main base of operation, Ogle International Airport, but the company does not request weather information from it.

2.5. The Aerodrome

The Guyana AIP shows that the runway orientation is 08/26 whereas the orientation is actually 10/28. It is also noted that the length of this airstrip is 4800ft as recorded in the AIP, however maintenance personnel had reduced the total length of the runway by 1600ft and was only maintaining 3200ft of runway. The new threshold of RWY28 was marked by orange marker cones. The part of the runway that was not maintained is still usable, but regular maintenance would enhance it.



3.0. CONCLUSION

3.1. Cause

The probable cause of the accident was that the aircraft was slow and close to the threshold on left base of RWY29. The pilot executed and maintained a steep left turn which resulted in the aircraft experiencing an incipient accelerated stall.

3.2. Contributory Causes

1. The approach to landing was not properly configured, which resulted in an unsafe and unstable approach.
2. Although he felt the aircraft buffeting, the pilot did not recognize that there was an impending accelerated stall and did not react in a timely manner to correct it.
3. The weather was not conducive to VFR operations.
4. Given the prevailing weather conditions, the pilot should not have descended below the MSA of 3000ft.
5. It is believed that the pilot may have established a mindset to land because another pilot had landed four minutes earlier.

3.3. Findings

1. This accident was avoidable.



2. The aircraft should not have departed from Ogle International Airport, given the reported weather conditions at the destination.
3. The aircraft had no reported mechanical deficiencies that could have contributed to the accident.
4. The pilot was properly licensed and qualified for the flight, but demonstrated a standard of airmanship and aeronautical knowledge less than that required for a pilot in command.
5. He had acquired a total of 2396:00hrs and approximately 1200hrs on type with 750hrs being command time.
6. The pilot was unable to satisfactorily display knowledge in areas that are vital for safe aircraft operations.
7. The company is suitably staffed for its operations.
8. The company did not make use of the weather forecasting services provided by the National Weather Watch Center and does not have adequate arrangements in place for pilots to be given accurate weather reports prior to departing to various hinterland locations.
9. The length of the airstrip was unilaterally reduced by 1600ft by its owner. This reduction was not notified to the GCAA or to aircraft operators.
10. Information entered in the AIP in relation to the aerodrome' orientation is incorrect.



4. Recommendations

1. The Pilot must be retrained in the following areas for the amount of time indicated:-
 - a) Aviation Weather in general; contents and interpretation of aviation weather reports and forecasts. – at least 10hrs.
 - b) Cockpit Resource Management, with emphasis on single crew operations. – at least 5hrs.
 - c) Decision making in a single crew environment, including the importance of self-discipline. Developing a sense of Situational Awareness in order to recognize hazards early and actions to be taken to avoid or mitigate these. – at least 5hrs.
 - d) Recognizing impending stalls and how to correct these. This must include recognition of the Stall Warning Horn. – at least 5hrs.
 - e) Review and retraining in all aspects of aircraft operations, especially approach and landing procedures to re-enforce the need to stabilize the aircraft on final before attempting to land. – at least 5hrs.
 - f) Flight planning must include an alternate course of action in event an unplanned situation develops. This 'Plan B' must include a plan to proceed to an alternate airstrip or back to base. There must be no pre-determined mindset to complete the mission. – at least 5hrs.
 - g) These activities must be completed satisfactorily and the pilot must fly for at least six months with training captains. Part of this training must be conducted during two rainy seasons. After completion of the flight training, he must be checked by the Chief pilot or Director of Operations before being released as pilot in command.

2. The operator must:-



- a) Provide training in weather observation and reporting to its agents at all destinations. This training must include the necessity for accurate reports including all essential elements of a weather report and the effects on aircraft operations.
 - b) Provide training to the operations Staff who receive weather reports on the contents of weather reports and the proper recording of same.
 - c) Encourage pilots and operations staff to use the services provided by the National Weather Watch Center.
3. The operator must introduce and maintain a system that ensures that its pilots and other technical staff remain current in all areas of flight operations. Apart from briefs during skills tests, this can be done by means of regular group sessions, seminars, and guest lectures, etc. and by setting periodic oral and written examinations. This will encourage pilots to continue reading after ground school in order to keep their knowledge current.
 4. In view of the normally difficult terrain and the heavy work load of single crew operations in the Cessna Caravan, the operator may wish to consider moving to two crew operations on some of the more difficult routes and aerodromes.
 5. The GCAA must advise the aerodrome owner to maintain and make available the full length of the runway for use by pilots.
 6. The GCAA must update the AIP to show that the aerodrome orientation is 10/28 and publish the corrected information as required.
 7. The GCAA should consider a system for assessment and approval for foreign flight schools that will be acceptable for persons desirous of flying in Guyana.
 8. Bearing in mind the generally challenging operating conditions for aircraft operating in Guyana, the Authority may consider a requirement for two crew operations for certain single crew aircraft/operations.

5. Actions Taken since the Accident

The following actions have been taken by the company:

1. Contact has been established with the National Weather Watch Center and weather reports are being obtained for use by pilots.



2. Operations staff have been instructed to ensure that all elements of the weather report are recorded on the operational flight plans. These are checked daily to ensure correctness.
3. Specially identified senior pilots have been identified to carry out impromptu assessment checks with company pilots.
4. In-house training in Aeronautical Decision Making will be done with all pilots.
5. A skilled consultant is being retained to do CRM and crew assessment of all pilots.
6. An aeronautical meteorology expert is being retained to carry out training for pilots, flight operations staff and company representatives at various hinterland locations.