

TITLE



GENERAL INFORMATION:

Name of Operator:	Air Services Limited (ASL)
Aircraft Manufacturer:	Britten Norman Company
Aircraft Model:	BN2A-26
Nationality and Registration Marks:	8R-GAR
Place of Accident/Region:	Kopinang Airstrip/Region#8, Guyana – 04 57 27.99N 059 51 36.02W
Date of Accident:	12 th April 2017
Time of Accident:	15:46hrs UTC

REPORT No. GAAIU 3/1/15

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

AIP	-	Aeronautical Information Publication
AMEL	-	Aircraft Maintenance Engineer Licence
AMO	-	Approved Maintenance Organisation
AOC	-	Air Operator Certificate
ASL	-	Air Services Ltd.
ATC	-	Air Traffic Control
CPL	-	Commercial Pilot Licence
CG	-	Center of Gravity
EFCIA	-	Eugene F. Correia International Airport
FOM	-	Flight Operations Manual
GAAIU	-	Guyana Aircraft Accident and Incident Investigation Unit
GARs	-	Guyana Aviation Requirements
GCAA	-	Guyana Civil Aviation Authority
GCARs	-	Guyana Civil Aviation Regulations
GST	-	Guyana Standard Time
ICAO	-	International Civil Aviation Organisation
MEL	-	Minimum Equipment List
RWY	-	Runway
S/N	-	Serial Number
Sta.	-	Station
TBO	-	Time before Overhaul
TSN	-	Time since New
TSO	-	Time since Overhaul
VMC	-	Visual Meteorological Conditions
UTC	-	Coordinated Universal Time



Synopsis:

The pilot stated that during the landing roll and on application of brakes, he felt the aircraft wheels locking up due to the wet grass surface. He modulated the brake pedal and simultaneously raised the flaps in an attempt to achieve maximum braking. The aircraft did not stop. He then moved the mixture controls to the cut off position and steered the aircraft towards an adjacent playfield but observed an occupied vehicle there. He then steered the aircraft into a construction site that was located off the end of the usable portion of the runway, where the aircraft came to a stop.

Two persons, the pilot and one passenger, were not injured and exited the aircraft unaided.

There was no fire.



1. Factual Information

1.1. History of the Flight

On 12th April 2017 the aircraft departed from the company base at the Eugene F. Correia International Airport (EFCIA), at 12:14hrs, for Mahdia Airstrip. The aircraft was programmed to do a series of shuttles to various airstrips in the Region 8 area. The accident flight was the second shuttle between Mahdia and Kopinang. The previous flight was normal.

For the second shuttle, the aircraft was loaded with one passenger and cargo for a flight to Kopinang Airstrip. The aircraft departed Mahdia at 15:12hrs with an estimated flying time of 24 minutes. As the aircraft approached Kopinang, rain was observed over the airstrip. This caused the pilot to hold for about 10-15 minutes East of the field to allow the rain to pass.

The aircraft landed, but during the landing roll the wheels locked up. The brakes were modulated, and the flaps were raised but the aircraft did not stop. The pilot then moved the mixture controls to shutoff and steered the aircraft left towards a playfield. This was occupied and he turned the aircraft right, into a construction site that was located off the end of the usable portion of the runway. The aircraft stopped in the construction area.

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	1	0	2
Total	1	1	0	2

1.3. Damage to aircraft

The starboard wing tip and wing were damaged. The starboard main undercarriage was broken and pushed rearwards. The starboard nacelle structure, between stn.54.0 and stn.88.0 was damaged

1.4. Other Damage

There was no other damage.

1.5 Personnel Information - Pilot

Gender:	Male
Date of Birth/Age:	31 st January 1981/36 years
Nationality:	Guyanese
License:	Guyana CPL #306
Date of issue:	1 st June 2012
Date of last medical:	8 th November,2016
Valid until:	31 st May 2017
Aircraft type rating:	C172, C206, BN2 Islander,
Last Proficiency Check on Type:	31 st March 2017
Total hours:	4300hrs (approx.)
Hours in last 90 days:	244:32hrs
Hours in last 30days:	87:53hrs
Hours in last 7 days	15:35hrs
Hours in last 24 hours:	2:45hrs

There are no limitations on the pilot's Class 1 Medical.

1.6 Aircraft Information

1.6.1 General

Manufacturer:	Britten Norman Aircraft Company
Year of Manufacture:	1972
Aircraft Model:	BN2A-26
Aircraft S/N:	306



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Certificate of Registration:	No. 250 issued 1995
Certificate of Airworthiness:	No. 222; valid until 16 th January 2018
Total Airframe Hours:	15,218:26hrs
Maximum Take-off Weight:	6600lbs
Last Scheduled Inspection:	100hrs
Time since last Inspection:	19:13hrs
Next Inspection Due:	50hrs/31:47hrs
Port Engine Model:	Lycoming O-540-E4C5
Engine S/N:	L-19738-40E
Engine TSN:	6470:03hrs
Engine TSO:	1309:15hrs
Starboard Engine Model:	Lycoming O-540-E4C5
Engine S/N:	RL25851-40E
Engine TSN:	2014:22hrs
Port Propeller Type:	Hartzell HC-C2YK-2CUF/FC8477A-4
Propeller S/N:	AU13012B
Propeller TSN:	3378:38hrs
Starboard Propeller Type:	Hartzell HC-C2YK-2CUF/FC8477A-4
Propeller S/N:	AU12560B
Propeller TSN:	13074:12hrs
Propeller TSO:	2409:12hrs
Fuel Type:	AVGAS 100LL

The BN2A Islander is a ten-seater, utility aircraft. It is a high-wing cantilever monoplane with a rectangular fuselage and two wing-mounted engines. The rectangular cross section fuselage, is furnished with a conventional tail unit and fixed tricycle landing gear. Its fuselage is light alloy monocoque with aluminum spars, stringers, and frames covered by aluminum alloy skins. On the ground, the aircraft is steered by its nose gear and the rudder control. Brakes should be tested for efficient operation as soon as possible after the aeroplane has started its taxi roll, in preparation for takeoff.

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.

1.6.3. Mass and Balance

Information from the Load Sheet indicates a total payload of 1694lbs and a computed takeoff weight of 6245lbs. The total payload represents the weight of one passenger and 1559lbs of cargo. Records indicate that the aircraft was loaded within its Center of Gravity (CG) limitations.

1.7 Meteorological Information

The weather reported at the time of the occurrence by the pilot was – a cross-wind, isolated showers around the field, ceiling 2500-3000ft, no sunshine, sky overcast. The incident occurred during daylight hours. The runway surface was wet.

1.8 Aids to Navigation

There are no aids to navigation at this airstrip.

1.9 Communications

At the time of the occurrence the aircraft was landing. The pilot relayed landing through another aircraft to Air Traffic Control (ATC).

1.10 Aerodrome Information

The following information, pertinent to the Kopinang Airstrip, was taken from the Guyana Aeronautical Information Publication.

Aerodrome Identification:	SYKO
Coordinates:	04 57 27.99N 059 51 36.2W
Elevation:	2500 ft.
Runway orientation:	07/25
Runway length:	2000ft

Runway width: 50ft

The airstrip is located in Region No.8 in the south-western area of Guyana. The runway has a grass surface. Drainage is very poor, and the surface becomes waterlogged after a heavy shower.

The windsock is unserviceable.

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 aircraft stopped in a construction site, at the end of the runway. The starboard wing and starboard main undercarriage were damaged. Otherwise the aircraft remained intact.

1.13 Medical and Pathological Information

The pilot completed a toxicological test for prohibited substances. These tests were negative.

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, seat belt and harness were intact. The co-pilot seat, where the passenger was seated, and its seat belt were intact. The passenger reported a few bruises from the sudden stop.

1.16 Tests and Research

No special tests or research were carried out.

1.17 Organisational and Management Information

1.17.1 Air Services Ltd.

Air Services Ltd is a commercial aircraft operator that holds Guyana Air Operator Certificate (AOC) # 001. It is primarily a domestic charter operator, with operations from its base at the EFCIA. International operations are conducted as requested. The company operates a variety of aircraft including BN2 Islanders, Cessna Single Engine Variants, Turbo Thrush Commanders and helicopters. Technical management positions are held by persons who are suitably qualified and experienced.

The company also holds Guyana Approved Maintenance Organization Certificate #003. The AMO has the required management, supervisory and line staff to effectively carry out the tasks it undertakes and utilizes the AMEL system as the basis for maintenance certification. The maintenance facility is co-located with its aircraft operations at the EFCIA and includes hangar space, offices, and several specialized workshops. Base and line maintenance are done on airframes, engines, avionics, instruments and propellers for aircraft below 5700kg. The company is approved to carry out these tasks on the various aircraft types they own.

1.17.2 ASL Flight Operations Manual

The company's Flight Operations Manual (FOM) was reviewed. The FOM indicates that the company operates twenty-seven aircraft in the Transport Category and two in the Aerial Work Category.

The FOM has criteria for determining the usability of domestic aerodromes. The manual advises that if a pilot suspects that an airstrip may be in bad condition, he is required to circle whilst taking a good look from the air. The decision on usability of the airstrip is made by the pilot-in-command and he should restrict or suspend operations until the conditions are corrected.

The FOM has a list of Specific Airfield Restrictions and Prohibitions. The restriction for the operation of BN2A Islander aircraft at Kopinang Airstrip, allows a maximum landing weight of 6300lbs.

1.18 Additional Information

1.18.1 Interview with the Pilot

The pilot stated that he is type rated on the BN2 and Cessna 206. On the morning of the accident, he was scheduled to begin flying at 8.30hrs GST and arrived at work at 7:45hrs GST. Prior to departing from EFCIA, he did the pre-flight inspection and did not find anything wrong with the aircraft. He had flown the day before. He spent the evening with his family and retired at about 21:30hrs GST; he was well rested.

He had successfully completed a route and airstrip check to Kopinang and has been going there for about 3 years. He goes to the airstrip regularly, so he is familiar with the characteristics of the runway, which has a grass surface. He was aware of the construction work that was being done on the last 500ft of the runway. He stated that the windsock is damaged and therefore unserviceable.

He made a normal landing and applied the brakes, but the aircraft did not slow down. He steered the aircraft towards a flat area, but as he approached this area, he observed that it was occupied by a truck, with the contractor's equipment. So, he turned off the engines and steered the aircraft away from the truck and headed for a soft area, where construction was being done. The aircraft came to a stop in this area as soon as the right landing gear got into the soft spot. He immediately shut down the selectors for electrical equipment. He and the passenger evacuated the aircraft. He then inspected the aircraft and noticed that the right landing gear was bent backwards.

The visit to the accident site noted that the flaps were in the takeoff position. The pilot said that he raised the flaps as soon as he applied the brakes and realized that the aircraft was not stopping. He had raised the flaps early in the landing roll, in effort to stop the aircraft, as he felt that this would maximize braking. He explained that by raising the flaps, the load from the wings would be reduced and transferred to the wheels and this should slow the aircraft down. When asked, he said that this procedure was not stated in the FOM.

Before departing Mahdia, he had received a favourable weather report from an untrained person on the ground at Kopinang, via HF radio. This report stated that the weather was



good. He also noted that the weather, for the previous shuttle to Kopinang, had been excellent.

With regard to the construction, he stated that it was being done on the last 500ft of RWY07; leaving a distance of 1500ft, for aircraft to operate on. The NOTAM, relating to the construction, is not very specific. It just says work in progress and calls for caution. He also noted that when the work started about two months ago, he was caught by surprise as he was not aware of it at that time.

He was asked to explain what is a normal landing. He stated that this required a landing with normal speeds and the flap settings. The aircraft would stop within 700-800ft. this would allow a safe landing within the available 1500ft with the construction in progress. The company policy includes the need to utilize the most efficient means of braking when landing on a wet runway. A lot depends on the pilot's own decision making as to whether a landing is done or not. He had landed at this airstrip, in similar conditions on several occasions. He stated that the recommended approach speed is 68kts. If the aircraft is light the speed could be a lot slower. He further stated that it is necessary to ensure that the aircraft does not float as this would use up even more runway. He noted that the stalling speed is 35kts.

He was asked to explain his landing techniques for this particular landing, including use of brakes and flaps. He said that he aimed to touch down about 300ft beyond the threshold, as the threshold itself is very soft and slushy from constant use. He did touch down where he had planned. He landed with full flaps. When he realized that the aircraft was not stopping, he raised the flaps to transfer the weight from the wings to the landing gear to obtain maximum braking. He was feeling a little braking effect. He then modulated the brakes, but this was not effective. His approach speed was about 70-72knots. He was not sure about the landing weight, but the aircraft was not overweight. The company has a sub-base and bond at the point of departure, so the goods were weighed before departure. He did not overfly and circle the runway, but after holding, he proceeded low and flew parallel along the runway. He agreed that the conditions for landing were very bad. He said that if he was faced with similar conditions in the future, he would not land.

The passenger was seated next to him in the co-pilot seat. He did not have any conversation with the passenger as he did not know the passenger other than as a charterer. The passenger is a shop keeper. This shuttle was for this passenger. He was asked if the passenger may have influenced his decision to force the landing. He agreed that this was a possibility.

He did meet with the Chief Pilot and the Quality Officer after the accident but this was only a discussion on what had happened, but no firm decision was made as to how a recurrence could be avoided.

1.18.2 Interview with the Manager of Operations

In a brief telephone interview with the Manager of Operations, he stated that the company has no written or unwritten policy with regard to raising the aircraft's flaps during the landing roll, to help the aircraft to stop. He noted that this may be a pilot technique, where to increase the weight on the ground, the pilot may raise the flaps. He stated that the Cessna 206 manual does contain a statement to this effect, but there is no such statement in the Islander manual.

He also stated that after an accident, he and other management staff would meet with the pilot for discussions. No decisions are made at this time, in terms of company actions, as this stage is considered to be information-gathering. In keeping with regulations, the pilot stops flying and waits for further action from the GCAA. If considered necessary, the pilot may be required to do retraining and a general meeting may be held with all pilots to discuss the occurrence.

1.18.3. GCAA

The GCAA has issued an Advisory Circular – Aerodromes No. 01 with an effective date of 25th September 2013, advising pilots of the requirements for operating into uncontrolled aerodromes. For inflight operations, when preparing to land, pilots are required to make a complete circuit of the aerodrome, prior to landing, to make a proper assessment of conditions on the ground.

A NOTAM C16/17, was issued on 8th March 2017 advising pilots to operate with extreme caution due to work in progress at the Kopinang Airstrip.



2. Analysis

2.1. The Pilot

The pilot was properly qualified and experienced for the operation. There was no evidence of any pre-existing medical or behavioural conditions which may have adversely affected the pilot's performance during this flight. The toxicological tests, which he completed the day after the accident, showed negative results for psychotropic substances.

The pilot stated that he had to hold for about 10–15 minutes, East of the field, due to heavy rain. During this time, he should have analysed the situation he was confronted with, rather than just waiting for the weather to subside, so that he could make an approach and landing. This analysis should have included the following considerations:

1. The runway was already reduced by 500ft to facilitate construction.
2. The first 300ft from the threshold of the landing runway was soft and slushy and therefore unusable.
3. The top surface of the runway was grass.
4. The runway surface was wet.
5. There was a down slope.
6. There was no windsock, but it is common, that a heavy shower is generally followed by a calm wind on even a tail wind.
7. The passenger in the right seat was the customer whose goods were being transported, therefore the pressure to complete the mission, may have taken priority over safety.

Consideration of the factors in items 1–6 should have alerted the pilot that a landing in these conditions would have been unsafe, especially as the normal landing roll of 700-800ft would have been increased significantly. Nevertheless, when he decided to land, he did not overfly the runway to verify what landing conditions he had to contend with. Even at this point he could have made the decision not to land there. Further, the pilot did not operate in keeping with a local standard operating procedure which requires pilots to overfly and circle the runway before landing at uncontrolled airstrips.

The pilot stated that he had operated into the airstrip frequently for the past three years. This together with the fact that he had left Kopinang less than one hour previously, when the weather was excellent, may have led to complacency.

2.2. The Aircraft

2.2.1. Maintenance

The aircraft has a Certificate of Airworthiness which is valid until 16th January 2018. Records indicate that the aircraft was being maintained in accordance with the approved maintenance schedule. There were no noted defects or deferred maintenance items.

2.2.2. Mass and Balance

The company has a sub-base at Mahdia where the cargo and passenger were weighed before departure. The load sheet indicates that the aircraft was not overloaded, and the cargo was loaded within the CG limits. The aircraft was also within the MLDG specified in the FOM for the aircraft.

2.3. The Airstrip

The airstrip has a total length of 2000ft but only 1500ft was available for aircraft operations as construction work was in progress on the last 500ft of the runway. Further the first 300ft was soggy and unusable. The grass surface became water-logged following heavy rain. These factors, together with the down slope and a possible adverse wind component, would have increased the landing roll.

An unserviceable windsock did not allow for a satisfactory assessment of the prevailing wind conditions.

2.4. The Weather

This accident occurred just before noon, following a heavy downpour and in overcast conditions.

2.5. Survival Aspects

The seats and seat belts functioned satisfactorily.

2.6. The Company

The company was appropriately certified for the operation. The twenty-seven aircraft, listed in the Transport Category and the two aircraft listed in the Aerial Work Category in the FOM, represents seven different aircraft types. Apart from the Operations Manager and the Chief Pilot, the FOM does not mention any other supervisory positions designating persons responsible for managing individual aircraft types. It is considered that the responsibility entrusted to the Operations Manager and Chief Pilot may be overwhelming.

There is nothing in the FOM requiring pilots to overfly and circle the runway, when operating into an uncontrolled airstrip. However, GCAA Advisory Circular: Aerodromes No.01, dated 13-09-10, clearly states in paragraph B)4. The requirement for pilots to comply with this manoeuvre.

2.7. The GCAA

The NOTAM, published by the GCAA, did not give sufficient details about the construction work at the airstrip. There is no indication of where, or the extent of, the work being done.



3. Conclusion

3.1 Cause

This accident was caused because the aircraft could not be stopped, after landing, within the usable portion of the runway.

3.2 Contributory Factors

1. The decision to land, without making a proper assessment of the runway conditions.
2. The wetness of the runway, which prevented effective braking.

3.3 Findings

3.3.1. The Pilot

1. The pilot was suitably qualified for the operation.
2. His last APC on type was satisfactorily completed on 31st March 2017.
3. The pilot was familiar with the airstrip conditions, having operated into the airstrip frequently for three years.
4. The pilot did not make a proper assessment of the airstrip conditions before landing.
5. The pilot, by his own admission, was complacent and displayed poor judgement by landing in unsatisfactory conditions.

3.3.2. The Company

1. The company holds an Air Operator Certificate and an Approved Maintenance Operator Certificate.
2. The quantity and variety of aircraft operated by the company, may exceed the capacity of its present operational management structure.
3. Maintenance service provided by the AMO is satisfactory.
4. There is nothing in the FOM requiring pilots to overfly and circle the runway, when operating into an uncontrolled airstrip.



3.3.3. The Aircraft

1. The aircraft had a valid Certificate of Airworthiness and was maintained in compliance with regulations.
2. The aircraft was not overloaded.

3.3.4. The Weather

The weather at the airstrip at the time of the accident was VMC. However, a heavy downpour prior to the accident, resulted in a significant amount of water on the runway during the landing.

3.3.5. The Airstrip

1. Enough safety precautions were not taken, to ensure that the construction work was properly notified and demarcated for continued safe aircraft operations at the airstrip.
2. The absence of a serviceable windsock at the airstrip is unacceptable.

3.3.6. GCAA

The NOTAM, published by the GCAA, did not give sufficient details about the construction work at the airstrip.

4. Safety Recommendations

4.1. The Pilot

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

1. Aircraft Performance with emphasis on:
 - i. Landing techniques, including landings into short runways, and the effects of heavy rainfall on unprepared surfaces.
 - ii. Weather and the different effects of a calm wind, tail wind, head wind and cross wind.
 - iii. The effect of runway gradient on aircraft landing and takeoff.
2. Crew Resource Management with emphasis on single crew operations. This must include attitude, the need to guard against complacency and the importance of self-discipline, situational awareness, problem solving and decision making and guarding against the determination to complete a mission.
3. It is recommended that the pilot should review the Company Operations Manual, to remind himself of company operating procedures into various airstrips.
4. The pilot should review the aircraft flight manual to refamiliarize himself with all operating procedures contained therein.

4.2. The Airstrip

1. It is recommended that the contractor carrying out the construction work on the airstrip should be urged to expedite completion of the job.
2. Further upgrading works should be considered to cater for cambered grading to facilitate proper drainage of the existing runway.
3. A windsock should be immediately installed at the airstrip.

4.3. The Company

1. The company should consider employing/identifying Fleet captains for each of the aircraft types it operates.



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2. The company should include the requirement for pilots to overfly and circle airstrips before landing, when operating into uncontrolled airstrips.
3. Although it is noted that there was a time lapse between receipt of the airstrip weather report and the time when the pilot arrived at the airstrip, the company should consider the need to provide basic training in weather observation and reporting to persons at various hinterland locations who are expected to provide such reports to pilots.

4.4. The GCAA

The NOTAM, published by the GCAA, did not give sufficient details about the construction work at the airstrip. Better use could have been made of the “plain language” section of the published NOTAM, to include specific information on the area of construction and usable runway length available.

END