



Australian Government

Australian Transport Safety Bureau

Runway excursion involving Gippsland Aeronautics GA-8, VH-AZH

50 km NW of Hollins Bay ALA (Avoid Island), Queensland, 23 March 2017

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Addendum

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Runway excursion involving Gippsland Aeronautics GA-8, VH-AZH

What happened

On the afternoon of 23 March 2017, the pilot of Gippsland Aeronautics GA-8 Airvan, VH-AZH, prepared for a departure from Avoid Island aeroplane landing area (ALA)¹ (Figure 1), Queensland (Qld) for a passenger charter flight to Mackay, Qld.

The company had elected to split the load of five passengers and cargo between two aircraft, a Cessna 206 and the GA-8.² On board the GA-8 were the pilot and three passengers, along with 30 kg of cargo and 92 kg of fuel, resulting in a take-off weight of 1,521 kg.³

While preparing for the departure, the pilot observed a 5–10 kt wind from the south-east and elected to use runway 14 for take-off. Runway 14 was a grass runway, 800 m long and included a slight rise in the middle. At the end of the runway was a vertical drop of about 2 meters down to a rocky beach.

Figure 1: Avoid Island ALA



Source: Google Earth, annotated by ATSB

¹ Aeroplane landing area: An area of ground suitable for the conduct of take-off and landing of aeroplanes.

² The Cessna 206 can be fitted with up to five passenger seats, the GA-8 can be fitted with up to seven passenger seats.

³ The structural maximum take-off weight of VH-AZH was 1,905 kg.

At about 1555 Eastern Standard Time (EST), the pilot in the GA-8 commenced the take-off run ahead of the Cessna 206. During the take-off run, the pilot maintained slight back pressure on the control column to minimise the weight on the aircraft nose wheel. The rotation⁴ speed for the take-off was 58 kt. The pilot elected to use a point about half way along the runway as the decision point for the continuation of the take-off, this point was located just after the crest in the runway. As the aircraft passed the decision point, the pilot noted that the airspeed was about 40 knots and engine indications were normal. As the aircraft performance was satisfactory, the pilot elected to continue the take-off.

As the aircraft continued on the downhill side of the crest, the aircraft encountered a soft patch of runway surface, resulting in a slight deceleration. As performance quickly returned, the pilot did not consider this to be an issue.

As the aircraft approached the end of the runway, just prior to reaching the rotation speed, the pilot felt a significant deceleration. The pilot identified that insufficient runway remained to stop the aircraft, and in an attempt to avoid the aircraft falling over the vertical drop, elected to continue the take-off.

The aircraft did not take-off before overrunning the runway and became airborne as it passed over the vertical drop at a speed of about 50 kt. While manoeuvring to avoid large rocks and obstacles (Figure 2), the pilot maintained a nose high attitude to minimise the effect of any impact. The aircraft was unable to maintain height and descended over about a further 100 m until the landing gear and underside of the rear fuselage impacted rocks. As the aircraft decelerated, the impact through the rudder pedals forced the pilot's ankle against the control column.

Figure 2: Accident site



Source: Operator, annotated by ATSB

After the aircraft came to rest, the passengers began to evacuate the aircraft. The pilot secured the aircraft and assisted the passengers with the evacuation. After securing the aircraft, the pilot then contacted the pilot of the Cessna 206 and advised them not to attempt to take-off.

The pilot of the Cessna 206 taxied that aircraft to the end of runway 14, contacted emergency services and provided assistance to the occupants of the GA-8.

The pilot of the GA-8 suffered a fractured ankle, the passengers were uninjured in the accident.

⁴ Rotation: the positive, nose-up, movement of an aircraft about the lateral (pitch) axis immediately before becoming airborne.

Pilot comments

The pilot of VH-AZH provided the following comments:

- The pilot landed on runway 14 at Avoid Island ALA about 15 minutes prior to the accident flight. After landing, the pilot taxied the full length of the runway before turning around to return to the threshold of runway 14 to meet the passengers. While taxiing, the pilot did not detect the soft patches in the runway. The pilot observed that the grass was dense and about 100 mm in length.
- Performance calculation charts in the GA-8 pilot operating handbook did not provide for a runway with long wet grass and both an uphill and downhill component. Therefore, the pilot had used the 'worst case' scenario when calculating the take-off distance required⁵ for runway 14 at Avoid Island ALA. The pilot calculated the take-off distance required to be 590 m when assuming a two percent upslope for the entire take-off run and short dry grass.
- The wind conditions at the time of the take-off were not consistent. A change in wind speed or direction may have contributed to the accident.
- The company chief pilot operated from Avoid Island ALA three days prior to the accident flight and found the ALA to be in good condition.

Operator comment

The operator of VH-AZH provided the following comments:

- After the accident, the grass on the runway was mowed and the runway was inspected. The operator found the significant deceleration toward the end of the take-off run was the result of an area of soft runway surface and mud. During the pilot's taxi after the previous landing, and during the accident take-off run, this area had been concealed by grass.
- The pilot had received training at Avoid Island ALA and had recently operated to the ALA.

Weather and prior rainfall

The pilot reported 5–10 kt of wind from the south-east, cloud at about 1,500 ft and patches of drizzle in the Avoid Island area at the time of the accident.

Avoid Island did not have recorded weather observation data. Weather stations at nearby locations, Middle Percy Island and St Lawrence (Figure 3), reported the below rainfall totals⁶ over the days prior to, and the day of the accident (23 March).

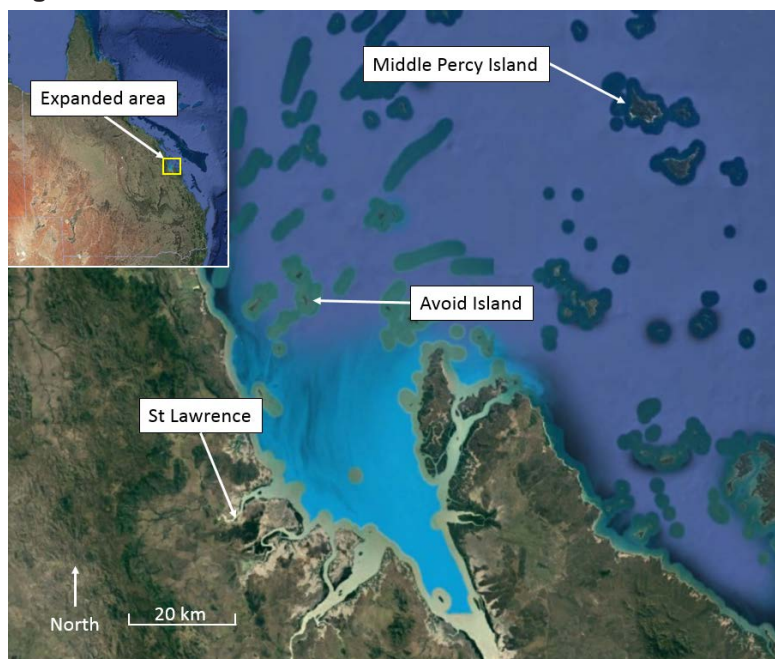
Table 1: Rainfall totals at Middle Percy Island and St Lawrence

Date	Middle Percy Island	St Lawrence
20 March	20.0 mm	16.2 mm
21 March	81.0 mm	70.8 mm
22 March	44.6 mm	66.4 mm
23 March	23.2 mm	36.4 mm
24 March	3.4 mm	46.2 mm
Total	172.2 mm	236.0 mm

⁵ Take off distance: The horizontal distance required for an aircraft to accelerate from stationary, take-off and climb over a 50 ft (15 m) obstacle. As runway 14 at Avoid Island ends with small bushes, the remaining climb to 50 ft may be calculated to be conducted over the beach and water after clearing this obstacle.

⁶ Daily rainfall for the listed day is the 24 hour total rainfall from 0900 on the day prior until 0900 on that day.

Figure 3: Avoid Island location



Source: Google Earth, annotated by ATSB

Safety analysis

The Chief Pilot had visited the island three days prior to the accident flight and found the ALA in good condition, however, rainfall over the intervening period created soft patches in the runway surface.

The operator chose to split the load between two aircraft to provide more margin for the operation and the pilot calculated that sufficient runway was available for the GA-8 take-off. However, the soft patches, along with wet grass, prevented the aircraft from completing the take-off in the runway available.

Findings

- The soft patches in the runway surface, concealed by grass, very likely degraded aircraft performance during take-off. The location of the soft patches towards the end of the runway prevented the aircraft taking off before the runway end.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Aircraft operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they are taking the following safety action:

Aeroplane landing area management

- The operator has taking over management of maintenance of the Avoid Island ALA. This will enable the operator to ensure that the ALA is suitable for proposed operations.
- The operator is investigating the feasibility of works to improve drainage on the ALA.
- The guidance documents for all regularly used ALAs have been updated and significantly expanded.

- More rigorous pilot training of ALA operations will be conducted in future. The operator is investigating the use of an ALA which simulates the conditions of Avoid Island ALA and also has a cross runway to provide for crosswind training and assessment.

Safety message

When operating from an ALA, the pilot must take great care to ensure that the ALA condition is suitable for the proposed operation. ALA operations can present numerous and varied challenges which may affect the safety of flight. In this case, the Chief Pilot had visited the island just three days prior, however, rainfall over those three days had greatly impacted on the serviceability of the ALA. In addition, the dense grass present created difficulties in identifying the soft patches of runway.

The Civil Aviation Safety Authority advisory publication: [CAAP 92-1 Guidance for aeroplane landing areas](#) provides the following information on the use of ALAs:

The surface of a landing area should be assessed to determine its effect on aeroplane control and performance. For example, soft surfaces or the presence of long grass (over 150 mm) will increase take-off distances while moisture, loose gravel or any material that reduces braking effectiveness will increase landing distance.

General details

Occurrence details

Date and time:	23 March 2017 – 1555 EST	
Occurrence category:	Accident	
Primary occurrence type:	Runway excursion	
Location:	50 km NW of Hollins Bay ALA (Avoid Island), Queensland	
	Latitude: 21° 58.83' S	Longitude: 149° 39.87' E

Aircraft details

Manufacturer and model:	Gippsland Aeronautics GA-8	
Registration:	VH-AZH	
Serial number:	GA8-07-111	
Type of operation:	Charter - passenger	
Persons on board:	Crew – 1	Passengers – 3
Injuries:	Crew – 1 (Serious)	Passengers – 0
Aircraft damage:	Substantial	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to operations involving the travelling public.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.