Australian Government
Australian Transport Safety Bureau

Collision with terrain involving a Grumman G164, VH-LKN

near Tharwa, Australian Capital Territory, on 6 August 2015

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

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Collision with terrain involving a Grumman G164, VH-LKN

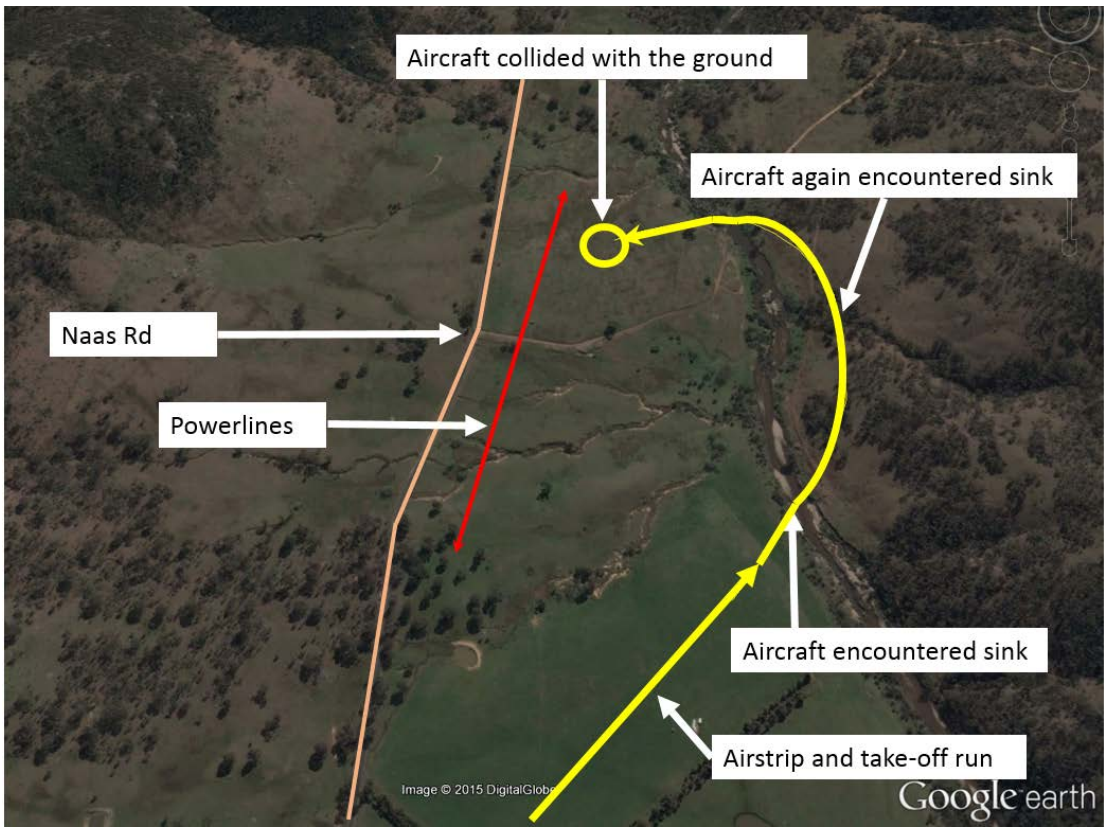
What happened

On 6 August 2015, the pilot of a Grumman G164 aircraft, registered VH-LKN, was conducting aerial spreading of superphosphate on a property about 33 km south-west of Tharwa, Australian Capital Territory. The target zone for the spreading was about 7 km to the south-east, and at an elevation about 1,000 ft higher than the airstrip and loading site.

The pilot commenced operations at about 1000 Eastern Standard Time (EST) and completed spreading of six loads of superphosphate. The pilot then had a lunch break and refuelled the aircraft to a total of about 180 L of fuel. The aircraft was also loaded with about 500 kg of superphosphate, which was about half its carrying capacity. The pilot observed a light, westerly wind of about 2 to 5 kt in the vicinity of the airstrip.

At about 1400, the pilot commenced the take-off run for the seventh load of the day. As the aircraft became airborne, the aircraft started to sink (Figure 1). To stop the aircraft sinking, the pilot applied the dump lever to start dumping the load of superphosphate. The aircraft then started to climb, so the pilot stopped dumping the load. The pilot also commenced a shallow left turn, away from rising terrain. As the aircraft turned, when at about 100 ft above ground level, it started to sink again. As it sank, the pilot felt a shake through the airframe, indicating that the aircraft was close to stalling. The pilot re-applied the dump lever to open the hopper door and try to reduce the aircraft load. Simultaneously, the pilot lowered the aircraft's nose and rolled the wings level, to try to recover from the incipient stall.

Figure 1: Departure airstrip, aircraft track and accident location



Source: Google earth and pilot recollection – annotated by the ATSB

The pilot sighted powerlines, a road and a row of trees ahead, beyond which the terrain rose steeply. The aircraft continued to descend and the pilot maintained the aircraft in a normal nose attitude for landing. As the aircraft neared the ground, the pilot reduced the throttle to idle and held the aircraft control stick in the full back position. The tailwheel struck the ground first, and then the right main landing gear dug into soft ground. The aircraft flipped over and came to rest inverted.

The pilot sustained minor injuries and the aircraft was substantially damaged (Figure 2).

Figure 2: Damage to VH-LKN

Source: Pilot

Pilot comments

The pilot provided the following comments:

- The airstrip was at an elevation of about 2,100 ft above mean sea level. The target pasture was about 1,000 ft higher than the airstrip.
- The airstrip was about 500 m in length and the fuel and chemical load was relatively light. The aircraft was well within its operational limitations.
- The weather forecast had indicated calm conditions, and the temperature was about 14°C.
- The sink that the aircraft encountered may have been a downdraft coming off the hill.
- If the airstrip had been higher up and closer to the target zone, the pilot would have had more time to dump the load, less distance to climb on each load, and a more accurate assessment of the wind conditions.
- Dumping liquid takes a few seconds, but granular substances like superphosphate take minutes for the hopper to empty when dumping the load.
- After the accident, the pilot verified that the hopper door was open, and superphosphate was present in the paddock, indicating that it had been dumping at the highest rate. Despite that, about 300 kg of superphosphate remained in the hopper.

Safety message

The pilot stated that the key to avoiding similar incidents was to understand the atmospheric conditions in steep mountainous country. Variations in wind strength and direction due to terrain can have serious consequences on flight safety, particularly when operating at low airspeeds and close to the ground.

ATSB investigated a similar accident involving a Grumman G-164A, in AO-2014-001.

General details

Occurrence details

Date and time:	6 August 2015 – 1400 EST	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	33 km SW of Tharwa, Australian Capital Territory	
	Latitude: 35° 33.30' S	Longitude: 148° 59.68' E

Aircraft details

Manufacturer and model:	Grumman American Aviation Corporation G-164B	
Registration:	VH-LKN	
Serial number:	10B	
Type of operation:	Aerial work	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – 1 (Minor)	Passengers – Nil
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 fare-paying passenger operations.

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.