Australian Government

Australian Transport Safety Bureau

Loss of control and collision with terrain involving Cessna R172K, registered VH-DLA

Near Sutton, New South Wales, on 13 April 2021

ATSB Transport Safety Report

Aviation Occurrence Investigation (Short)

AO-2021-016

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Cover photo: Operator

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Addendum

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Safety summary

What happened

In the early afternoon of 13 April 2021, a Cessna R172K aircraft registered VH-DLA (DLA) departed Canberra Airport, Australian Capital Territory, with a pilot and observer onboard to conduct powerline survey work to the north of Sutton township, New South Wales.

About 3 hours into the flight, while conducting powerline inspection in the vicinity of Tallagandra Lane, nearby witnesses observed the aircraft flying low above the trees before commencing a left turn that continued in to a steep descent and collision with terrain. The pilot and the observer were fatally injured, and the aircraft was destroyed.

What the ATSB found

The ATSB found that while manoeuvring to align the aircraft to inspect a powerline, the aircraft aerodynamically stalled and entered a spin at a height that was insufficient for recovery prior to the collision with terrain.

What has been done as a result

Following the accident, the operator amended the training and checking section of their Operations Manual to incorporate Threat and Error Management (TEM) and Situational Awareness (SA) training modules for powerline low-level survey operations. The amendments enhanced existing topics in the operator’s crew resource management training and stipulated learning outcomes and assessment criteria specific to TEM and SA.

The operator also advised that they intended to introduce an airspeed ‘manoeuvre margin’ to take in to account the increased stall speed associated with steep turns.

Finally, the operator plans to modify their aircraft to include an angle of attack indicator to supplement the installed stall warning and a g-meter with recording and data download capability to enable post flight review.

Safety message

This accident highlights the need for pilots to manage airspeed and bank angle to minimise the risk of an aerodynamic stall. This is particularly important when operating in close proximity to the ground, such as during take-off, landing and when conducing low-level air work, as recovery may not be possible.

The investigation

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of resource required to obtain a safety benefit from an investigation. For this occurrence, a limited-scope investigation was conducted in order to produce a short investigation report and allow for greater industry awareness of findings that affect safety and potential learning opportunities.

The occurrence

On 13 April 2021 at 1324 Eastern Standard Time,[1] a Cessna R172K aircraft registered VH-DLA (DLA) departed Canberra Airport, Australian Capital Territory, with a pilot and observer onboard to conduct powerline survey work to the north of Sutton township, New South Wales.

At 1622 DLA crossed Tallagandra Lane (Figure 1) and the observer proceeded to inspect powerlines servicing properties to the east of the lane. Following the completion of two orbits, the pilot initiated a right turn and tracked to the north-north-east.

Witnesses in the area described that, following the right turn, the aircraft was flying low above the trees before commencing a left turn that continued into a steep descent and collision with terrain. The witness reports, including one from an experienced pilot, were consistent with a loss of control and entry into a spin preceding the ground impact. The pilot and the observer were fatally injured and the aircraft was destroyed.

Analysis of the final segment of recorded Garmin GPS[2] and OzRunways[3] flight data (see the section titled *Recorded data*) identified that the last Garmin GPS data point at 1624:48 showed the height of the aircraft was about 164 ft above ground level (AGL) about 115 metres from the accident site. The final OzRunways data point, recorded at 1624:50, was about 80 metres from the accident site and indicated that the aircraft was about 80 ft AGL (Figure 1).

[1] Eastern Standard Time (EST): Coordinated Universal Time (UTC) + 10 hours.
[2] GPS: Global Positioning System. A satellite-based radionavigation system.
[3] OzRunways: An electronic flight bag application providing subscriber flight information and navigation service.

Figure 1: Recorded flight path data shown relative to the accident site

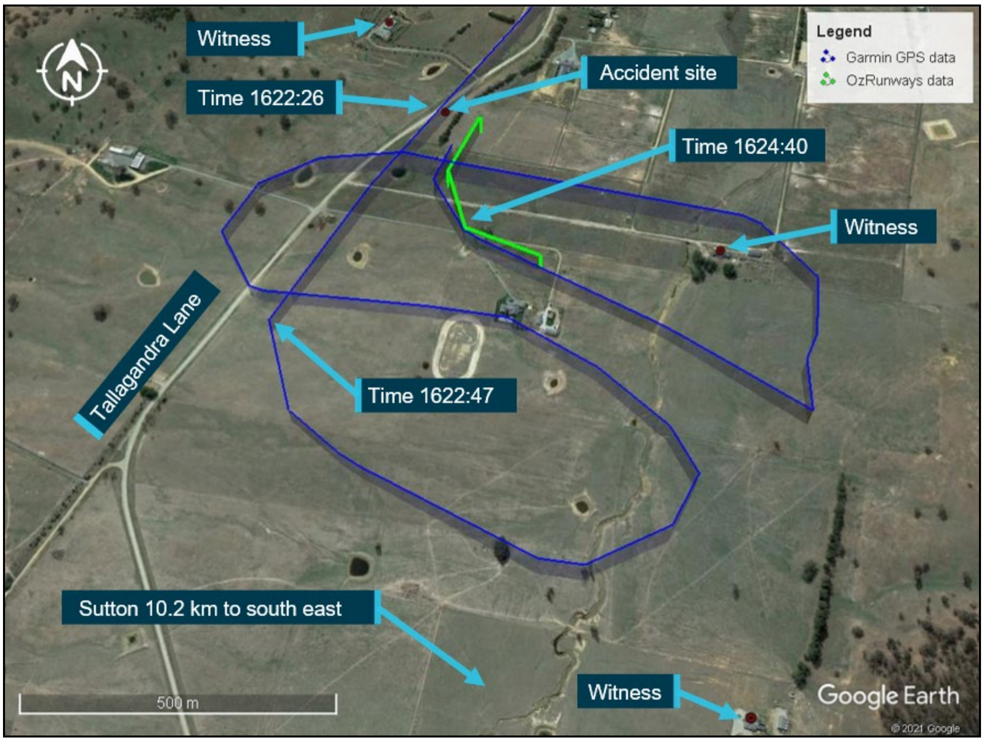

Image description: DLA flight path – Garmin data is primarily referenced due to its higher sample rate and increased vertical accuracy. The final segment of OzRunways data is included as it provided the closest data point to the accident site.
Source: Google, with Garmin GPS and OzRunways data, annotated by the ATSB

Context

Pilot information

The pilot of VH-DLA (DLA) held a Commercial Pilot Licence (Aeroplane) issued in December 2019. The pilot also held a single engine aeroplane class rating, and a manual propeller pitch control design feature endorsement. The pilot completed a low-level aeroplane operational rating on 28 November 2019, valid for 2 years, and a single-engine flight review on 15 March 2021, valid until 31 March 2023.

The pilot held a Class 2 Aviation Medical Certificate issued by the Civil Aviation Safety Authority, without medical restrictions, which was valid until 1 November 2023.

The operator's records indicated the pilot had a total flying experience of 968.8 hours to the last recorded flight on 12 April 2021, of which about 572 hours were in the Cessna 172. In the previous 90 days, the pilot had flown 164.6 hours on type, and in the previous 30 days the pilot had flown 66.4 hours on type.

The pilot completed the operator's low-level proficiency check on 9 February 2021 and was issued with a low-level, aerial survey certificate of competency to conduct powerline inspections without supervision. The pilot's accumulated flight time conducting powerline survey work, following the operator's approval, was about 135 hours.

Workload and fatigue

The operator had identified that aerial powerline survey work could be fatiguing for pilots and observers. To manage this, the operator applied work time limitations for pilots with fewer than 200 hours of powerline survey experience. Those pilots were limited to 6 hours of survey flight time per day with flights, conducted in sorties of 2-3 hours duration.

After having 2 days off, the pilot had ferried the aircraft from Albury, New South Wales on the day prior to the accident and then logged about 5 hours of survey flight time over two sorties. On the day of the accident, the pilot had flown an earlier survey sortie of 1.3 hours duration and had been flying for about 3 hours when the accident occurred.

In flight, it was normal practice for the observer to direct the pilot to fly a pre-prepared route while the observer inspected the powerlines. To facilitate the observer's work, the pilot was required to make constant changes to the aircraft's heading and power setting to manoeuvre the aircraft into the optimum position for the observer. This resulted in a higher sustained pilot workload than that involved in flying an aircraft in straight and level flight. The operation of the aircraft at low level and relatively slow speeds also left little room for error. Research has shown that when an individual has to detect specific types of targets or stimuli over an extended period, their performance will decrease (Wickens and Hollands 2000).

The ATSB considered the effect of the sustained attention to flight parameters over the final sortie, but there was insufficient evidence to establish whether the pilot was affected by a level of fatigue that may have impacted their performance.

Post-mortem examination

The post-mortem and toxicology examinations did not identify any indicators of incapacitation or substances that could have affected the pilot's capacity to perform the flight.

Aircraft information

DLA was a single engine, Cessna R172K aircraft. It was manufactured in the United States in 1977 with serial number R1722809 and was first registered in Australia in 1978. It was a four-seat, high-wing aircraft, with a non-retractable tricycle undercarriage. The aircraft was powered by a Teledyne Continental Motors IO-360, six-cylinder, fuel-injected piston engine, driving a two-blade, constant speed propeller.

A maintenance release for the aircraft was issued following the completion of scheduled inspections on 2 March 2021 for day VFR[4] operations, at an aircraft time in service of 16,488.5 hours. There were no open defects recorded on the maintenance release and no outstanding or overdue maintenance was noted.

The aircraft's maintenance records also showed that in the 6 months prior to the accident, DLA's:

- pitot static system had been checked for leaks
- pressure altimeter had been checked for serviceability
- fuel quantity system had been calibrated.

The airspeed indicator was tested in October 2018 and found to be serviceable. At the time of the accident, the instrument had accumulated 283 hours, time-in-service.

A weight and balance assessment identified that, at the time of the accident, the aircraft's weight was about 979 kg, 178 kg below the aircraft's maximum gross weight limit of 1157 kg, and the aircraft's centre of gravity was within limits.

Aircraft stall and spin behaviour

The Pilot's Operating Handbook for the Cessna R172K specified that, depending on the aircraft's centre of gravity position, at its gross weight limit and with 10° of flap selected, the aircraft would stall[5] at between 41-43 knots indicated air speed. The altitude loss during recovery from a wings level stall could be up to 160 ft.

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[4] Visual Flight Rules (VFR): a set of regulations that permit a pilot to operate an aircraft only in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

[5] Aerodynamic stall: occurs when airflow separates from the wing's upper surface and becomes turbulent. A stall occurs at high angles of attack, typically 16º to 18º, and results in reduced lift.

A spin can result when an aircraft simultaneously stalls and yaws.[6] The yaw can be initiated by rudder application or by yaw effects from a range of factors that include aileron deflection, torque (engine power setting) and engine/propeller effects. A spin is characterised by the aircraft following a downward, corkscrew path and requires significantly more altitude for recovery compared to a wings level stall. The Cessna R172K Pilot's Operating Handbook specified that at least 1,000 ft should be allowed for a one turn spin and recovery.

Further, should a stall occur during a turn, the aircraft's behaviour becomes dependent on which wing stalls first. That is, it is possible for the upper wing to stall resulting in the aircraft rolling and yawing in the opposite direction to the turn.

Wreckage and impact information

The accident site was located about 10 km to the north west of the township of Sutton in an open field about 30 metres east of Tallagandra Lane. From the accident site, the terrain sloped up to the north-west by about 240 ft over a distance of about 600 m. The terrain dipped slightly to the east of the site, dropping about 50 ft over a distance of about 500 m.

Most of the aircraft wreckage was located next to the initial impact point. Larger items, including the propeller and the right undercarriage leg were found next to the fuselage. Items from the luggage locker were located within five metres of the aircraft's initial impact point. The most distant item from the main wreckage was the aircraft battery which was found near the edge of Tallagandra Lane. The limited spread of wreckage indicated that the aircraft impacted the terrain with little horizontal speed.

Examination of the wreckage showed that the aircraft impacted the ground in a near-vertical, nose-down attitude. Damage signatures on the wing leading edges indicated that the right wing impacted the terrain first. The outboard section of the right wing, leading edge, near the tip was slightly deflected up, which was consistent with the aircraft spinning to the right at impact.

Compression damage to the forward fuselage reduced the available cabin space. While the occupants were secured with 4-point harnesses, the accident was non-survivable.

Site and wreckage examination did not identify any aircraft defects that could have contributed to the accident and there was no evidence of birdstrike.

It was noted that the aircraft's wing flaps were extended. Assuming a correctly rigged flap system, examination of the flap actuator screw jack extension determined that the flaps were set in the down position, at 18-20°.

Inspection of the aircraft's stall warning system established that, other than damaged tubing attributed to the accident sequence, the warning horn sounded when suction was applied. The system was therefore considered serviceable prior to the accident.

Operational information

Powerline survey

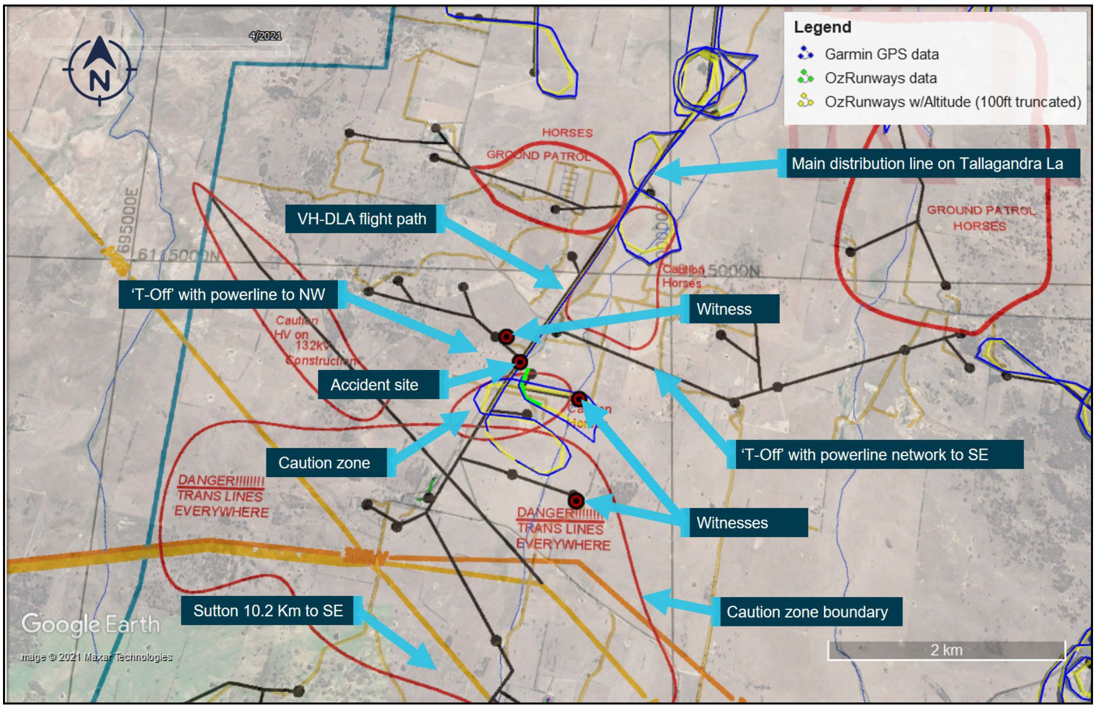
The role of the observer was to coordinate the powerline survey work. The observer monitored the survey's progress on a map depicting the electrical distribution network and directed the pilot to the sections of powerline to be inspected (Figure 2). The map was marked with warnings and cautions associated with network specific features and areas to avoid (no-fly areas) associated with dwellings, livestock and/or hazardous features.

The sequence in which the survey progressed was a combination of the flight crew's pre-departure planning and in-flight variations as determined by the observer. The pilot would fly the aircraft in response to the observer's directions provided it was safe to do so. The observer

[6] Yawing: the motion of an aircraft about its vertical or normal axis

would photograph any observed powerline defects and annotate their location on the distribution network map.

Figure 2: Aircraft flight path and electrical powerline network in the vicinity of the accident site



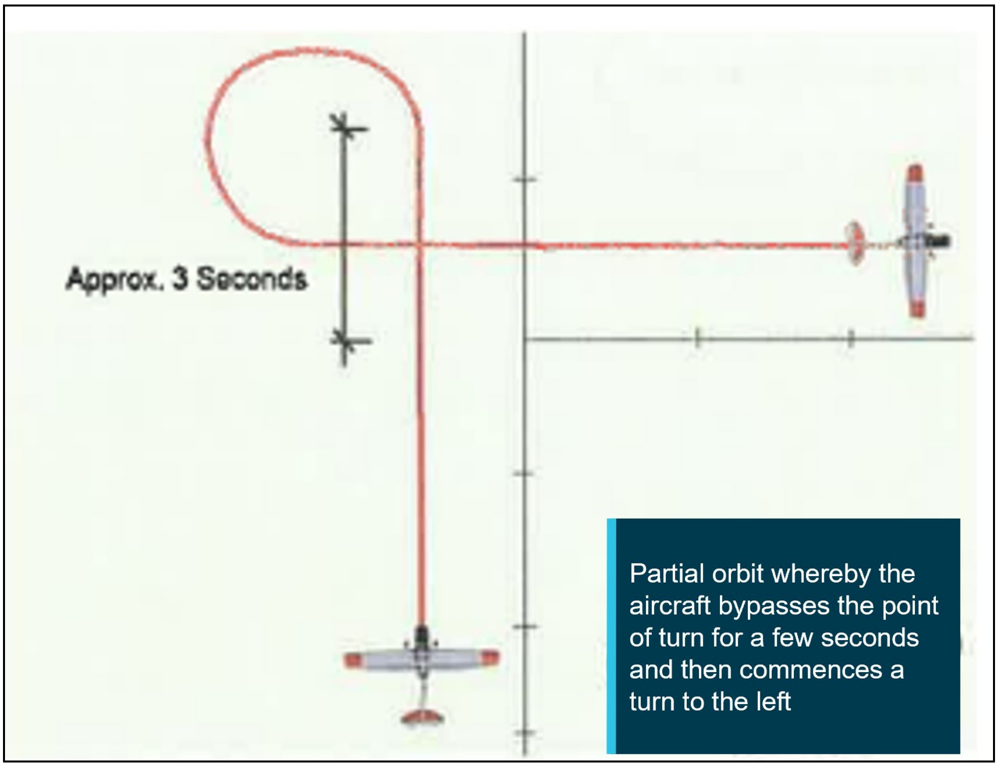
Source: Google, with operator supplied powerline network distribution map, and Garmin GPS and OzRunways data, annotated by the ATSB

To provide the right-seat observer with the best opportunity to detect defects, the pilot would position the aircraft to keep the powerline to the right of the observer, at a height of about 150 ft above ground level and 150 ft horizontally from the powerline. According to the operator, the speed of the aircraft would preferably be maintained above 70 kt to maintain a margin above the aircraft's stall speed and slow enough for the observer to note defects. The operator further advised that during survey operations the aircraft flaps were normally set at 10°.

The operator's Aircrew Operational Procedures Manual instructed pilots that when surveying T-Offs,[7] from a main distribution line that may require significant manoeuvring, the pilot should initiate a partial orbit of 270° commencing in the opposite direction to the T-Off orientation (Figure 3).

[7] T-Off: A junction in the power line distribution network branching from a main line.

Figure 3: Powerline survey T-Off positioning manoeuvre (partial orbit)



Source: Oberon Aviation Services and annotated by the ATSB

This was a standard re-positioning procedure that would result in a lower bank angle and wing load factor[8] while orientating the aircraft in the direction of the target T-Off.

With respect to aircraft aerodynamics, the wing load factor or g-force on the wings varies with the angle of bank in a level turn and has a direct influence on the aircraft stall speed. Specifically, as the angle of bank increases, the load factor and the stall speed of the aircraft also increases.

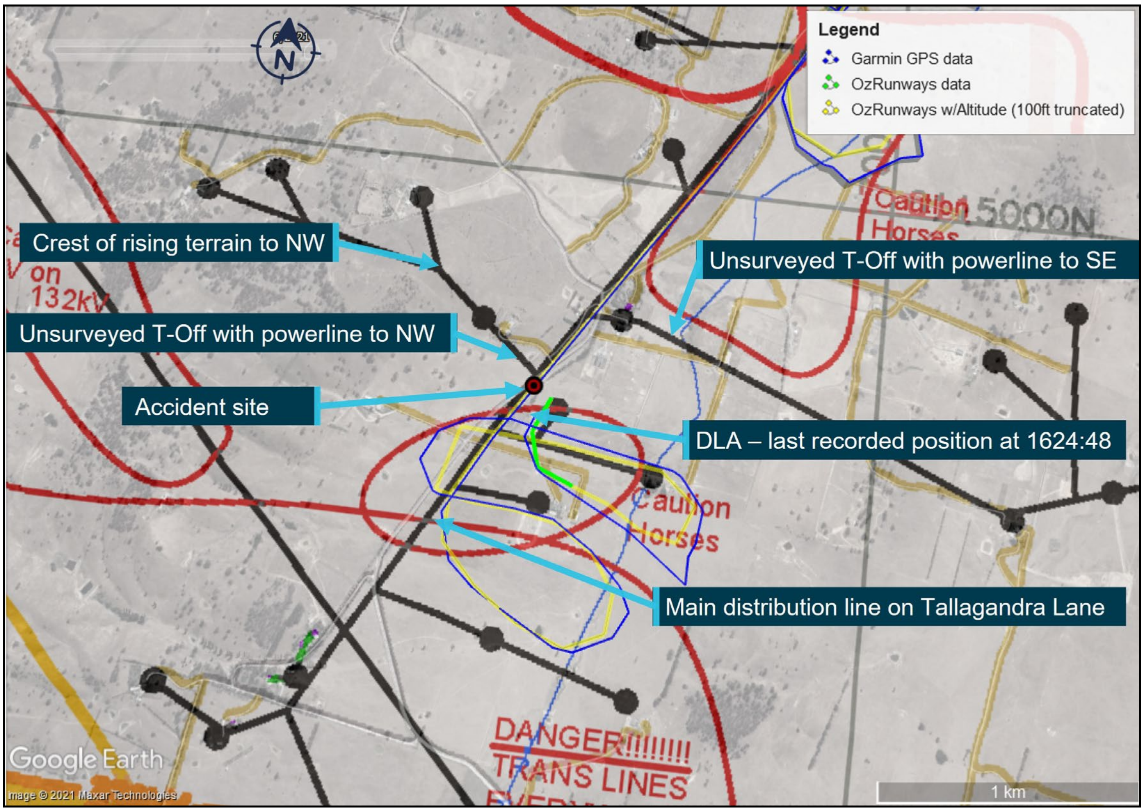
To turn, an aircraft must roll in the desired direction, which increases the aircraft's angle of bank. Turning flight lowers the wing's vertical lift component. To compensate (and prevent the aircraft from descending), the lift force must be increased by pulling back on the control yoke to increase the angle of attack of the wings. If the angle of attack reaches a critical angle, loss of lift and increased drag occurs, and the wing will aerodynamically stall.

Final flight segment

On completing the survey work to the east of Tallagandra Lane, the pilot conducted a turn to the north-north-east and momentarily tracked parallel to the main distribution line that ran beside the lane (Figure 4). Based on flight path data and progress notations on the electrical network distribution map, the next powerline to be surveyed was the branch to the north-west which departed the main distribution line near the accident site.

8 Load factor: the ratio of the aerodynamic force on the aircraft to the gross weight of the aircraft.

Figure 4: VH-DLA flight path in the vicinity of the accident site



Source: Google, with operator supplied powerline network distribution map, and Garmin GPS and OzRunways data, annotated by the ATSB

The operator advised the ATSB that the standard procedure to establish the aircraft to survey that branch would have been for the pilot to conduct a partial right orbit through 270° prior to intercepting the powerline. However, the witness accounts indicated that the aircraft banked left towards the branch immediately before the accident. The operator was unable to provide advice as to why the orbit manoeuvre was not performed at this point. Flight path data showed the pilot had performed the 270º partial orbit manoeuvre in similar situations earlier in the flight.

The ATSB considered whether the final turn may have been an evasive action by the pilot to avoid birdlife, however there was insufficient evidence to determine if that may have influenced the turn.

Meteorological information

The forecast meteorological conditions for the Canberra Airport area indicated winds from the north-west at 12-14 kt and no cloud below 5,000 ft AGL. Visibility was forecast to be 10 km or greater. The METAR[9] for Canberra Airport issued at 1600 was consistent with the forecast conditions, with recorded wind from the west-north-west at 10 kt with visibility of 10 km or greater and a temperature of 18º Celsius.

Witnesses in the accident area reported that visibility was unlimited, and there was little to no wind.

Recorded data

DLA was not equipped with a flight data or cockpit voice recorder, nor was it required to be. Flight path data from the OzRunways application and Airservices Australia secondary surveillance radar was provided to the ATSB. Data was also retrieved from an on-board Garmin Aera 500 GPS and a Garmin GPSMAP 60Cx portable GPS unit for analysis.

9 METAR: a routine aerodrome weather report issued at routine times, hourly or half-hourly.

Speed and position data from the Garmin 60Cx unit was used in the analysis of the aircraft's movement as it offered better resolution and was recorded at a higher sampling rate than the other sources.

Due to a gap in data between DLA's final recorded GPS position and the accident site, data from previous turns was used to estimate the performance of the aircraft during the final turn where the loss of control occurred.

Estimated values for speed, bank angle and stall margin during the final turn were derived from the analysis of data associated with a selection of turns conducted during the day's flying. Turns with a distinct radius, generally through greater than 90° were identified and selected for analysis. Turns that displayed an irregular radius or inconsistent data points were excluded from the analysis. The final group of 19 turns that were analysed included all five turns prior to the accident turn, plus selected turns at various points earlier in the flight. The group also included three turns that met the selection criteria and related to the flight conducted earlier in the day.

Indicative values of DLA's airspeed, angle of bank and stall margin were derived (Table 1). To facilitate the analysis, it was assumed that each turn was coordinated, at a constant altitude and at a constant speed. The aircraft weight and a wing flap position of 18° were also factored into the analysis.

The ATSB acknowledged the difference between the forecast winds and the local wind conditions observed by the witnesses. However, the analysis assumed nil wind speed as it was not possible to incorporate large changes in aircraft direction in the calculations. In order to assess the aircraft's performance, it was also necessary to convert the Garmin GPS ground speed data to calibrated airspeed by correcting for density altitude.

Table 1: Flight path data analysis

Time[10]	Time to accident	Speed (kt)[11]	Angle of bank (deg)	Normal load factor (g)[12]	Calculated stall speed (kt)[13]	Stall margin (kt)
1053:14[14]	5:31:38	72	41	1.33	55	17
1101:12[14]	5:23:40	53	33	1.19	52	1
1119:02[14]	5:05:50	68	34	1.21	52	16
1421:09	2:03:43	64	36	1.23	52	12
1445:52	1:39:00	61	30	1.16	51	10
1456:20	1:28:32	65	42	1.34	54	11
1544:21	0:40:31	58	38	1.26	52	6
1547:35	0:37:17	57	40	1.30	53	4
1608:07	0:16:45	62	32	1.18	50	12
1610:37	0:14:15	58	44	1.38	54	4
1618:06	0:06:46	69	24	1.09	48	21
1618:48	0:06:04	79	46	1.44	55	24
1620:45	0:04:07	78	33	1.20	50	28
1621:02	0:03:50	69	35	1.23	51	18
1622:52	0:02:00	75	31	1.16	50	25
1623:11	0:01:41	60	31	1.16	50	10
1623:45	0:01:07	57	34	1.20	50	7
1624:17	0:00:35	60	31	1.17	50	10
1624:45	0:00:07	56	33	1.19	50	6

For DLA's final turn after its last recorded Garmin GPS position at 1624:48, and assuming that the speed of the aircraft did not vary from the previous turn, the analysis indicated that DLA was likely being manoeuvred in a 50° banked turn to the left and was flying at a speed that was very near to the stall speed (Table 2).

In contrast to the other analysed turns, the load factor during the final turn was also found to be the highest and had the lowest stall margin that was demonstrated in the other turns. Had the wind direction and strength been similar to conditions recorded at Canberra Airport the stall margin in the final turn would have been greater.

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10 Local time at midpoint of turn.
11 Calibrated airspeed assuming nil wind.
12 Assumed a steady level coordinated turn.
13 Calculated from a MTOW, wings level, 18° of flap, stall speed of 50 kt (calibrated airspeed).
14 Prior flight.

Table 2: Estimated values for DLA's speed, bank angle and stall margin during the final turn

Time	Time to accident	Speed (kts)	Angle of bank (deg)	Normal load factor (g)	Calculated stall speed (kts)	Stall margin (kts)
1624:50	0:00:02	56[15]	50[16]	1.56	57	-1

Operator's response to the accident

Following the accident, the operator amended their Operations Manual (Training and Checking) to incorporate Threat and Error Management (TEM) and Situational Awareness (SA) training modules as applicable to low-level, powerline survey operations. The amendments enhanced existing topics in the operator's crew resource management training and stipulated learning outcomes and assessment criteria specific to TEM and SA.

The TEM module was intended to assist pilots and observers with the identification and management of threats associated with:

- weather
- operational considerations (including terrain, density altitude and power network complexity)
- aircraft performance
- time pressures
- decision making
- Go-No Go and escape options.

The SA training aimed to increase the maintenance of situation awareness as it related to the:

- obstacle environment
- aircraft performance and energy management
- speed and manoeuvre management (continual management and monitoring of aircraft attitude, critical airspeeds and balance).

It was intended that the training would be initially delivered to the operator's Training and Checking pilots who, in turn, would deliver briefings to pilots and observers at a standard equivalent to that of a flight instructor. An additional aircraft handling or 'fly safe' check will be conducted on all pilots and observers prior to the start of each powerline survey season.

The operator also provided detail of intended amendments to their low-level procedures to implement an airspeed 'manoeuvre margin' that will take in to account the increased stall speed associated with steep turns. The manoeuvre margin will be calculated by the pilot, and independently verified by the observer before each flight as part of the crew's risk assessment procedure and recorded in the daily operations diary. For the pilot's and observer's in-flight reference, the minimum manoeuvre airspeed will be temporarily marked on the airspeed indicator.

Further, the operator plans to modify their aircraft to include an angle of attack indicator and a g-meter with recording and data download capability. The instruments will supplement the aircraft's stall warning device by providing additional warning of an impending stall. A record of the maximum and minimum in-flight readings will be downloaded post flight for review by the Chief Pilot.

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15 No recorded data. Assumed from previous turn.

16 Calculated from an assumed arc starting tangential from the last known point to the accident location.

Other occurrences

Between 2011 and 2021, the ATSB investigated 21 fatal accidents involving piston engine aeroplanes flown in visual meteorological conditions that involved a loss of control and collision with terrain. While none of the 21 accidents involved aircraft engaged in powerline survey work, 11 involved single engine aeroplanes that aerodynamically stalled at a height from which recovery was probably impossible before ground contact.

Safety analysis

Introduction

The pilot and observer onboard VH-DLA (DLA) were conducting powerline survey work to the north of Sutton, New South Wales. Following the completion of two orbits over properties to the east of Tallagandra Lane, the pilot initiated a right turn and tracked to the north-north-east. The aircraft was then observed by witnesses to commence a left turn to the north-west followed by a steep descent and ground impact. Witness observations and wreckage characteristics were consistent with a loss of control and entry into an aerodynamic spin prior to the collision with terrain.

The ATSB found that the pilot was qualified to conduct low-level powerline survey work and was suitably rested to conduct the task. Further, while acknowledging that powerline survey work was more demanding on pilots than other flight activity, there was insufficient evidence to indicate that the sustained workload created a level of fatigue that affected the pilot's performance.

Site and wreckage examination did not identify any aircraft defects that may have contributed to the accident. This analysis will examine possible reasons for, and the nature of, the manoeuvring that preceded the accident.

Manoeuvre to the north-west

Following the turn to the north-north-east, the pilot would likely have been receiving directions from the observer based on progress of the survey work, which was being monitored with reference to the electrical network distribution map.

The ATSB established that, on completion of the turn, the T-Off immediately to the left of DLA's track linking a relatively short section of powerline to the north-west was likely chosen as the next section to be surveyed. The witness reports and flight data indicated that a direct turn towards that T-Off was initiated, rather than the partial orbit advocated by the operator. While the reason for this could not be established, a review of the manoeuvring prior to the accident indicated that partial orbits had been previously used to position the aircraft parallel to other branch lines.

Significantly, the direct turn towards rising terrain probably resulted in a higher bank angle/wing load factor, and therefore a higher stall speed, than aligning the aircraft via a partial orbit.

Loss of control

From the recorded data and witness accounts, DLA transitioned from a level, right turn to the north-north-east into a tighter, possibly climbing, left turn. From the ATSB's analysis of the turns conducted by the pilot earlier in the flight, it was estimated that the final turn was likely conducted at a comparatively high angle of bank and closer to the stall speed of the aircraft.

As the manoeuvre continued, the aircraft likely exceeded the critical angle of attack for the wing, causing the wing to stall. While no fault was identified with the aircraft's stall warning system, had the manoeuvring been relatively dynamic, there may only have been a small time interval between the activation of the warning and the actual stall.

Analysis of the recorded flight data identified that the aircraft had been operated relatively close to the stall speed during previous turns without a consequential loss of control. However, from the available evidence it was not possible to determine why control was maintained during those earlier turns.

Following the stall, the aircraft entered a steep, nose down aerodynamic spin that continued until the collision with terrain. The reason for the lower airspeed than used in the majority of the previous turns could not be determined however it may have been the result of deceleration associated with manoeuvring and/or initiation of a climb due to approaching rising terrain. Although the wind appears to have been relatively light, it could also not be ruled out that the aircraft encountered some turbulence in the lee of the rising ground that may have contributed to the accident.

The collision point was to the north-west of DLA's last recorded flight position and adjacent to the T-Off. When the aircraft entered the spin, it was significantly below the required height above ground specified by the aircraft manufacturer for recovery from a spin.

Findings

ATSB investigation report findings focus on safety factors (that is, events and conditions that increase risk). Safety factors include 'contributing factors' and 'other factors that increased risk' (that is, factors that did not meet the definition of a contributing factor for this occurrence but were still considered important to include in the report for the purpose of increasing awareness and enhancing safety). In addition 'other findings' may be included to provide important information about topics other than safety factors.

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

From the evidence available, the following findings are made with respect to the loss of control and collision with terrain involving Cessna R172K, registered VH-DLA near Sutton, New South Wales on 13 April 2021.

Contributing factors

- While manoeuvring to align the aircraft to inspect a powerline, control of the aircraft was lost at a height that was insufficient for recovery prior to the collision with terrain.

Sources and submissions

Sources of information

The sources of information during the investigation included:

- Airservices Australia
- Bureau of Meteorology
- Civil Aviation Safety Authority
- OzRunways
- the operator
- the aircraft manufacturer
- recorded data from the portable GPS unit in the aircraft
- a number of witnesses.

References

FAA 2016, Airplane Flying Handbook, FAA-H-8083-3B, U.S. Department of Transportation, OK 73125

Wickens CD & Hollands JG, 2000, Engineering psychology and human performance, 3rd edition, Prentice-Hall International Upper Saddle River, NJ

Submissions

Under section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. That section allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to the following directly involved parties:

- Civil Aviation Safety Authority
- the operator.

A submission was received from the operator. The submission was reviewed and, where considered appropriate, the text of the report was amended accordingly.

General details

Occurrence details

Date and time:	13 April 2021 – 1625 EST	
Occurrence class:	Accident	
Occurrence categories:	Operational, Terrain collisions, Collision with terrain	
Location:	near Sutton, New South Wales	
	Latitude: 35º 05.768' S	Longitude: 149º 10.754' E

Aircraft details

Manufacturer and model:	Cessna R172K	
Registration:	VH-DLA	
Operator:	Oberon Air Pty Ltd	
Serial number:	R1722809	
Type of operation:	Airwork	
Activity:	Powerline survey	
Departure:	Canberra, Australian Capital Territory	
Destination:	Canberra, Australian Capital Territory	
Persons on board:	Crew – 2	Passengers – 0
Injuries:	Crew – 2, fatal	Passengers – 0
Aircraft damage:	Destroyed	