Australian Government
Australian Transport Safety Bureau

Descent below glideslope involving Fairchild SA227, VH-VEU

About 17 km north-east of Brisbane Airport, Queensland on 2 July 2024

ATSB Transport Safety Report
Aviation Occurrence Investigation (Short)
AO-2024-040
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Cover photo: Brandon Giacomin

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Postal address: GPO Box 321, Canberra, ACT 2601
Office: 12 Moore Street, Canberra, ACT 2601
Telephone: 1800 020 616, from overseas +61 2 6257 2463
Accident and incident notification: 1800 011 034 (24 hours)
Email: atsbinfo@atsb.gov.au
Website: www.atsb.gov.au

Addendum

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Executive summary

What happened

On 2 July 2024, a Fairchild Industries SA227-DC, registered VH-VEU and operated by Corporate Air, departed Cobar Regional Airport, New South Wales for a passenger charter air transport flight to Brisbane Airport, Queensland. During the instrument landing system (ILS) approach into Brisbane, the aircraft descended below the glideslope and approximately 8 NM (14.8 km) from the runway triggered an air traffic control (ATC) minimum safe altitude warning.

ATC advised the crew that they were observed below the glideslope, however the aircraft continued descent below the glideslope until 3 NM (5.6 km) when the descent rate was reduced. The aircraft then passed above the glideslope before the rate of descent increased again and subsequently the glideslope was re-intercepted from above 1 NM (1.8 km) from the runway at 500 ft. The aircraft then followed a stabilised flight path to landing.

What the ATSB found

The ATSB found that the pilot flying descended the aircraft below the 3° glideslope after briefing and receiving a clearance for an instrument landing system approach. During the deviation, the aircraft's descent rate and altitude triggered an air traffic control minimum safe altitude warning.

Additionally, the pilot monitoring was not monitoring the glideslope and did not challenge the pilot flying to correct the deviation and reduce the aircraft's descent rate.

The ATSB also found that the operator's standard operating procedures (SOPs) contained areas of inconsistency when an aircraft entered visual conditions during an instrument approach, and that the Aeronautical Information Package (AIP) was unclear as to whether pilots were required to comply with precision approach flight tolerances.

What has been done as a result

Corporate Air made the following changes to its standard operating procedures after the incident:

- the instrument approach procedure has been updated:
  - the approach brief now requires discussion of expectations if visual conditions arise
  - the statement that 'during a visual approach using the ILS, the glideslope calls do not need to be given' has been removed
  - a requirement to make callouts using reference to visual slope indications has been added.
- a note has been added to the visual approach procedures stating that crew require a clearance to discontinue an instrument approach in controlled airspace
- increased focus on pilot monitoring skills during:
  - proficiency checks, which will now include standard instrument departure and standard arrival routes
  - line training for new flight crew.
- addition of a pilot monitoring sector to the annual line check.

Additionally, the Civil Aviation Safety Authority advised that it will be amending information regarding precision approach flight tolerances in the Aeronautical Information Package to include clearer links to existing legislative requirements and the use of defined terms.

Safety message

Effective monitoring in a multi-crew environment is paramount to aircraft safety. Bringing deviations to the attention of the pilot flying, whether in instrument or visual meteorological

conditions, ensures the aircraft remains on a safe flight path and receiving confirmation from the pilot flying can assist in early detection of incapacitation.

When an approach has been briefed, flight crew share the same mental model of the expected flight path and deviations can be readily identified, advised and corrected. If the approach type changes without further briefing, both crew members are unlikely to have the same expectations, making it difficult for the pilot monitoring to identify and advise the pilot flying of deviations.

The investigation

Decisions regarding the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation and the associated resources required. 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 2 July 2024, a Fairchild Industries SA227-DC, registered VH-VEU and operated by Corporate Air, departed Cobar Regional Airport, New South Wales, for a charter air transport flight to Brisbane Airport, Queensland with 2 flight crewmembers and 10 passengers on board. The flight crew consisted of a captain, undergoing training as pilot in command under supervision, performing the role of pilot monitoring (PM). A training captain, in the position of first officer, was the pilot flying (PF).[1] At 1511 local time, on approach to Brisbane Airport, air traffic control (ATC) advised the flight crew to expect an instrument landing system (ILS)[2] approach to runway 19L.[3] The crew reported that they conducted a brief of the expected ILS approach as per the operator's standard operating procedures (SOPs).

At 1515, the flight crew commenced descent during which the aircraft entered instrument meteorological conditions.[4] At 1526, ATC cleared the flight crew to conduct the ILS approach to runway 19L, which the crew read back.

About 1 minute later the aircraft overflew the waypoint BETSO[5] (Figure 4), the initial approach fix for the ILS 19L approach, at approximately 4,400 ft above mean sea level (AMSL) (Figure 1) and commenced the ILS approach. The crew recalled that they became visual with the water and clear of cloud at about that time, but that was not reported to ATC and no request was made to discontinue the ILS approach and conduct a visual approach. The PM also recalled that upon becoming visual, they observed patches of lower cloud, but none that would affect their ability to proceed visually to the runway.

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1 Pilot Flying (PF) and Pilot Monitoring (PM): procedurally assigned roles with specifically assigned duties at specific stages of a flight. The PF does most of the flying, except in defined circumstances, such as planning for descent, approach and landing. The PM carries out support duties and monitors the PF's actions and the aircraft's flight path.

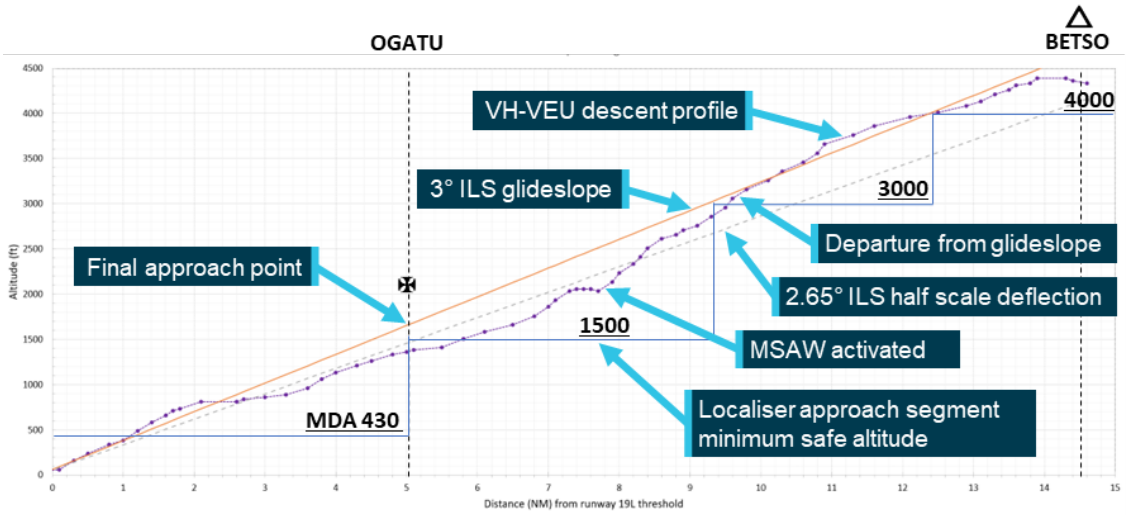
2 Instrument Landing System (ILS): a precision instrument approach system which normally consists of a VHF localiser providing horizontal guidance and a UHF glideslope providing vertical guidance.

3 Runway number: the number represents the magnetic heading of the runway. L specifies the left runway when there are parallel runways available.

4 Instrument meteorological conditions (IMC): weather conditions that require pilots to fly primarily by reference to instruments, and therefore under instrument flight rules (IFR), rather than by outside visual reference. Typically, this means flying in cloud or limited visibility.

5 Waypoint: a specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

Figure 1: Descent profile of VH-VEU



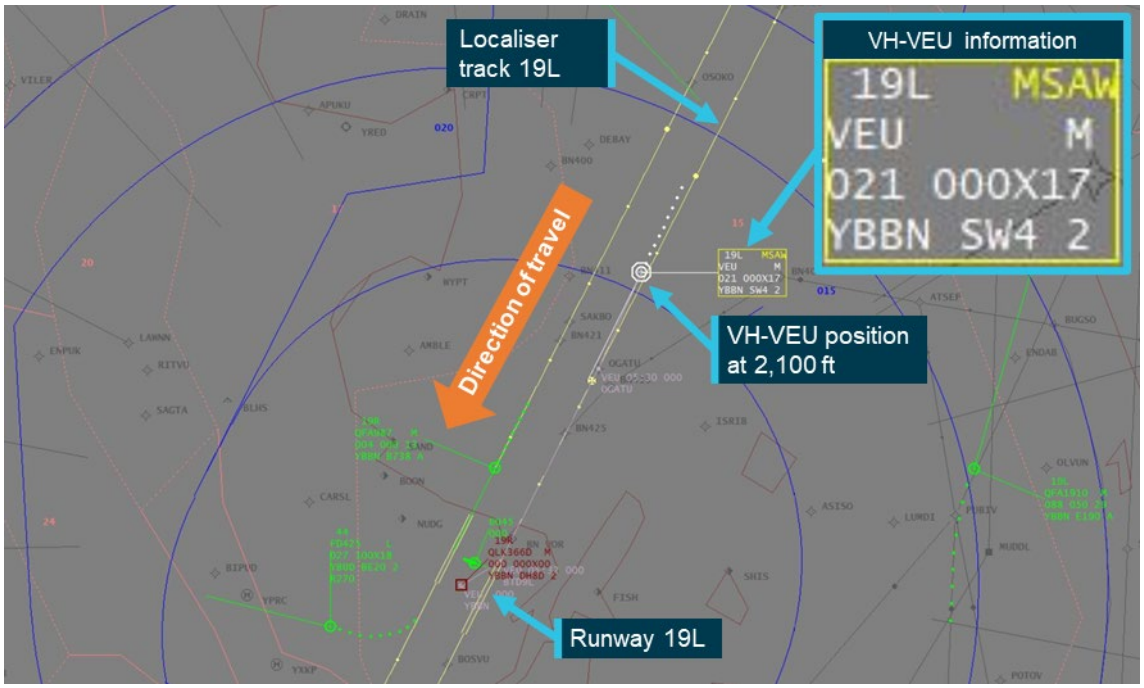
Source: Flight data from ADSB Exchange, annotated by the ATSB

Passing 3,000 ft and 9.5 NM (17.6 km) from the runway threshold, the aircraft began to descend below the 3° glideslope. The PM recalled that the PF advised that they would stay below the lower patches of cloud to ensure that they remained visual. At 1529:36, ATC radar recorded the aircraft at an altitude of 2,100 ft with a descent rate of 2,068 ft/min, approximately 8 NM (14.8 km) from the runway threshold and 400 ft below the glideslope. This descent rate and low altitude triggered an ATC minimum safe altitude warning (MSAW),[6] which was visually displayed (Figure 2) and aurally alerted to the approach controller. Upon receipt of the MSAW the controller assessed that the aircraft was above the minimum altitude on the radar terrain clearance chart and not in unsafe proximity to terrain. Therefore, a safety alert was not issued.

Instead, as the flight crew had switched the radio to the aerodrome controller's frequency, the approach controller alerted the aerodrome controller that the aircraft was below the glideslope, which the aerodrome controller then passed on to the crew. In response, the pilot monitoring asked the aerodrome controller if the glideslope was serviceable, to which they responded that it was. During the exchange, the aircraft entered the area surrounding the airport where MSAWs were inhibited, and the alert was no longer presented on the approach controller's display.

[6] Minimum Safe Altitude Warning (MSAW): an automated warning for air traffic controllers to draw attention to an aircraft that at its current descent rate is 60 seconds to terrain.

Figure 2: Approach controller display at 1529:46



Source: Airservices Australia, annotated by the ATSB

The aircraft continued descent and at the final approach point remained more than half scale deflection below the glideslope. At approximately 3 NM (5.6 km) the rate of descent reduced, with the aircraft passing above the glideslope, before increasing again and the glideslope being re-intercepted 1 NM (1.8 km) from the runway at 500 ft. The aircraft then followed a stabilised flight path to landing.

Context

Crew

The captain undergoing training held an Australian commercial pilot licence (aeroplane) and class 1 aviation medical certificate as well as an overseas air transport pilot licence that they were in the process of converting to the Australian equivalent. The captain had 5,350 hours of flying experience, of which 330 were obtained in the SA227-DC. They completed their initial line training with the operator in August 2023 before moving overseas in October 2023 to conduct training on a new aircraft type with a different operator. They returned to Australia and to flying duties with the operator in June 2024 and were conducting training due to the time spent away, with this flight being a check flight.

The training captain, operating as the first officer, held an air transport pilot licence (aeroplane) and class 1 aviation medical certificate. They had over 11,000 hours of flying experience, of which 851 were in the SA227-DC. They had previously conducted senior flying roles for the operator.

The ATSB found no indicators that the flight crewmembers were experiencing a level of fatigue known to affect performance.

Aircraft

VH-VEU was a Fairchild Industries SA227-DC fitted with two TPE331-12UA engines and capable of carrying up to 19 passengers and 2 flight crew.

Meteorology

Prior to commencing descent, the crew reported receipt of Brisbane Airport's automatic terminal information service (ATIS)[7] information 'Romeo' to ATC. This information included:

- few clouds at 600 ft and a layer of broken cloud at 1,200 ft[8]
- visibility reducing to 4,000 m in passing showers
- arriving aircraft were to expect an instrument approach procedure.

The ATSB obtained further information regarding the weather conditions that would likely have been encountered during the approach. The automatic METAR,[9] issued at 1530, reported few clouds at 600 ft, scattered cloud at 1,500 ft and broken cloud at 3,500 ft. Video footage from the airport (Figure 3) and satellite imagery showed cloud coverage consistent with the aerodrome meteorological reports.

Figure 3: CCTV image of weather conditions at Brisbane Airport at 1535

The image is taken from CCTV footage in the direction of the approach to runway 19L.
Source: Brisbane Airport, annotated by the ATSB

Crew actions

The PF reported having difficulty recalling details from the flight due to the time elapsed since the incident. However, they did recall that the aircraft had entered visual conditions. They also reported that they considered they were still complying with the ILS approach clearance. They advised that they were not required to maintain the glideslope, and they were permitted to descend to the localiser segment minimum safe altitudes.

The PM reported that the crew had briefed the expected ILS approach and had not included items relating to a possible transition to a visual approach. They also reported that due to the weather

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[7] Automatic terminal information service: the provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts. ATIS information is prefixed with a unique letter identifier and is updated either routinely or when there is a significant change to weather and/or operations.

[8] Cloud cover: in aviation, cloud cover is reported using words that denote the extent of the cover – 'few' indicates that up to a quarter of the sky is covered, 'scattered' indicates that cloud is covering between a quarter and a half of the sky, 'broken' indicates that more than half to almost all the sky is covered, and 'overcast' indicates that all the sky is covered.

[9] METAR: a routine report of observations of meteorological conditions at an aerodrome. METAR are normally issued on the hour and half hour.

conditions, they transitioned to a visual approach and were looking outside the aircraft rather than monitoring the aircraft instruments.

The PM also reported that they questioned the serviceability of the glideslope as a learned response from flying in an overseas environment where navigation aids were sometimes unreliable and required verification.

Instrument approach

Aeronautical Information Publication instrument approach requirements

To conduct the 19L instrument landing system (ILS) approach (Figure 4) in controlled airspace, the crew required a clearance from ATC. The Aeronautical Information Publication (AIP) stated that:

> Unless authorised to make a visual approach, an IFR flight must conform to the published instrument approach procedure nominated by ATC.

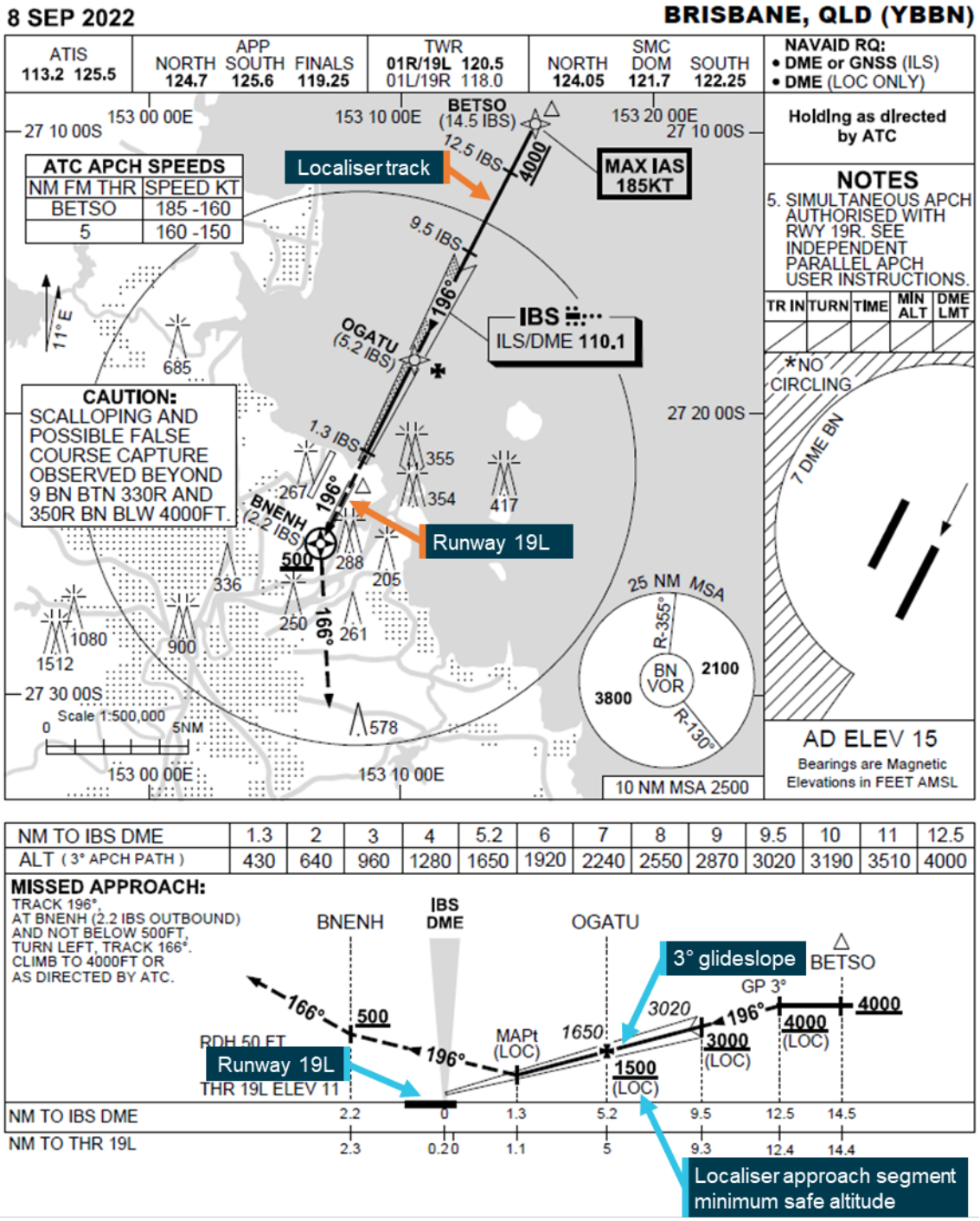
During an instrument approach, the crew was required to maintain the aircraft's flight path within certain flight tolerances. For an ILS approach the AIP stated:

> Pilots must conform to the following flight tolerances:
>
> a) To ensure obstacle clearance, both [localiser/Ground based augmentation system (GBAS) landing system] LOC/GLS final approach course and glideslope should be maintained within half scale deflection (or equivalent on expanded scale).
>
> b) If, at any time during the approach after the [final approach point] FAP, the LOC/GLS final approach or glideslope indicates full scale deflection, a missed approach should be commenced.

The AIP wording combined the terms 'must' and 'should', making it unclear as to whether this was a requirement or a recommendation. However, Airservices Australia confirmed that aircraft were required to comply with the vertical guidance of the glideslope when conducting an ILS approach, and that descent outside this vertical guidance could be safety critical.

For a 3° ILS approach, half scale deflection below the glideslope was the equivalent to an approach angle of approximately 2.65°. Airservices Australia also confirmed that a clearance to conduct the ILS approach was not a clearance to conduct the localiser approach, despite both approaches using the localiser for lateral guidance and sharing the same instrument approach chart.

Figure 4: Brisbane runway 19L instrument landing system approach



Source: Airservices Australia, annotated by the ATSB

Operator procedures

The operator's standard operating procedures (SOPs) defined the expectations of both the PF and PM during an instrument approach and emphasised the importance of the roles of both crew members in monitoring the approach.

> Both the PF and the PM shall monitor the progress of the approach using their own flight instruments, with the PM cross-referencing to the PF's flight instruments.
>
> It is an essential duty of the PM to automatically inform the PF of any deviation from the published approach procedure as briefed.

Prior to conducting an instrument approach, the operator required an instrument approach brief to be conducted. The operator's SOPs stated:

> Whenever changing from the intentions discussed in the briefing, the PF will re-brief accordingly.

The guidance around the instrument approach brief did not include a requirement to include the planned actions if there was an expectation of become visual during the approach. The approach guidance also advised:

> During a visual approach using the ILS, the glideslope calls do not need to be given.

The SOPs for conducting an ILS approach required the pilot flying to establish the aircraft on the localiser, then intercept and track the glideslope. Several speed and configuration changes were then required while maintaining the aircraft's flight path within the required tolerances of both the localiser and glideslope.

The pilot monitoring was required to monitor the aircraft's flight path and manage communication with ATC. The SOPs listed the mandatory callouts and required responses during an ILS approach, including when the aircraft deviated half scale deflection or greater from glideslope (Table 1). It was also stated that making callouts:

> … applies on all instrument approaches until 100 ft above the threshold height, even if visual flight conditions are established before reaching the minima.

Table 1: ILS approach callouts

Phase of Flight	Pilot Monitoring	Pilot Flying
Level flight, when outside ± 100 ft of the required altitude	Altitude	Checked
Speed + 10 KTS or – 5 KTS from target speed	Airspeed	Checked
Localiser or course bar moves from full scale deflection	Course bar active	Checked
Passing the outer marker/locator or its DME equivalent	Glideslope altitude checked	Checked
ILS or localiser approach, half scale deflection or greater	Localiser	Checked
Glideslope half scale deflection or greater	**Glideslope**	**Checked**
Speed outside approach speed profile	Airspeed	Checked
Below 1,000 ft AGL and VSI exceeds 1,000 fpm	Sink Rate	Checked
When reaching 200 ft to the applicable instrument approach minima	Approaching minima	Checked
At any time you get visual with the runway in sight	Runway visual in your … o'clock	Checked OR Nil sighting, continuing the approach
On reaching the minimum	Minima	Visual or Nil sighting, ground around

Source: Operator, emphasis added by the ATSB

The SOPs further required that:

> if advisory calls are required on more than two occasions in any instrument approach before the final approach fix or more than once beyond the final approach fix, the crew should initiate a missed approach.

Visual approach

Aeronautical Information Publication visual approach requirements

The AIP listed meteorological conditions required for an IFR aircraft to conduct a visual approach. These conditions included the requirements for the aircraft to remain clear of cloud, and be in sight of ground or water with an in-flight visibility of not less than 5,000 m. If these conditions existed:

> the pilot need not commence or may discontinue the approved instrument approach procedure to that aerodrome

The AIP also stated that when in controlled airspace, a clearance was required from ATC to conduct a visual approach. The crew was required to report 'VISUAL' to signify to ATC that the visual approach requirements could be met and maintained as part of any request for a visual approach.

Operator procedures

The operator's SOPs contained advice consistent with the AIP, that if the meteorological conditions for a visual approach were met:

> the pilot need not commence or may discontinue the approved instrument approach procedure to that aerodrome

The SOPs also required that:

> Before starting a visual approach, the PF must brief any other flight crew on the following, (as appropriate):
>
> - [lowest safe altitude/minimum safe altitude] LSALT/MSA terrain clearance
> - Relevant [control area] CTA boundaries
> - Expected manoeuvring to the final approach, including the runway, circuit direction, altitude and any restrictions
> - Required navigation aids and/or approach slope guidance system
> - Airport elevation
> - Go-round procedures

The operator advised that these items would be included in the initial approach briefing for an instrument approach if there was an expectation of becoming visual and being issued with a visual approach clearance.

The SOPs contained requirements for conducting a visual approach and landing that stated:

> Where possible approaches shall follow normal PAPI/T-VASI profile, i.e. 3 degrees. This angle will provide adequate height over threshold and the shortest landing distance. Level-off segments should be avoided when conducting runway approaches. Aim to fly a constant descent profile as per the AIP/Jeppesen profile. Where available, approach guidance must be used.

Runway 19L was equipped with a Precision Approach Path Indicator (PAPI)[10] which would have been visible from about 5 NM (9.3 km) from the threshold in visual conditions. The SOPs required that:

> When available, VASIS/PAPI must be used for approach slope guidance. Fly up indications must be responded to immediately unless the aeroplane is in level flight during daytime and in sight of ground or water.

The advisory callouts required from the PM when conducting a visual approach differed from those required when conducting an ILS approach (Table 2).

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[10] Precision Approach Path Indicator (PAPI): a ground-based system that uses a system of coloured lights used by pilots to visually identify the correct glide path to the runway when conducting an approach.

Table 2: Visual approach advisory callouts

Phase of Flight	Pilot Monitoring	Pilot Flying
At '500' foot AGL If all Stabilised Approach Criteria are met: Or If not stable:	 Stable Or Unstable	 Continuing Going-Around
Below 1,000 ft AGL and speed below or greater than +20 kt from target speed	Airspeed	Correcting
Below 1,000 ft AGL and VSI exceeds 1,000 fpm	Sink Rate	Correcting
When PAPI indicates aeroplane is more than one light above or below normal on slope profile	Glideslope	Correcting

Stabilised approach

A stabilised approach is one where an aircraft maintains a constant angle descent to the runway while other key flight parameters such as airspeed and aircraft configuration are controlled within specific ranges.

The operator's SOPs stated that all flights must be stabilised by 1,000 ft above airport elevation in instrument meteorological conditions and by 500 ft in visual meteorological conditions (VMC). To be considered to have met these stabilised approach criteria in VMC the aircraft was required:

> From 500 ft above ground level on the descent:
>
> - aircraft on the correct flight path and only small changes in heading/pitch/power are required to maintain it, and
> - speed is not less than VREF and not more than VREF + 20 knots indicated airspeed (KIAS), and
> - aircraft is in the correct/final landing configuration, and
> - sink rate is no greater than 1,000 ft per min, and
> - power setting is appropriate for the aircraft configuration.

These requirements were in accordance with the minimum altitudes recommended in guidance material for Part 121.200 from the *Civil Aviation Safety Regulations* (*CASR) Part 121 Acceptable means of compliance and guidance material (AMC/GM) - Australian air transport operations—larger aeroplanes* and the International Air Transport Association (IATA) guidance document - *Unstable Approaches: Risk Mitigation Policies, Procedures, and Best Practices (3rd Edition).* The flight data showed that the aircraft was stabilised by 500 ft.

There are significant benefits in establishing and maintaining a stabilised approach with a constant angle descent prior to these minimums and the operator's SOPs contained guidance that:

> Flight crew(s) should aim to organise descent profiles such that their aeroplane can readily meet the speeds, heights and configurations, relevant to any Standard Arrival Route/Instrument Approach Procedure(s), and as set out in the respective FCOM and approach gradient table to ensure a constant descent profile and should aim to become stabilised as early as possible in the approach.

A stabilised approach has the effect of reducing pilot workload and allowing greater focus on flight path and airspeed. In a multi-crew environment, stabilised approach criteria enables the pilot flying and pilot monitoring to share the same mental model of the expected flight path and the parameters within which the aircraft is required to operate. This allows the pilot monitoring to effectively detect and advise of deviations which could then be corrected by the pilot flying. The operator's SOPs highlighted the importance of effective monitoring and calling out of observed deviations:

> The PM shall maintain a parallel line of thought to that of the PF, constantly questioning mentally the actions being planned and executed. If the perception of what is required closely matches the events

> occurring, no comment need be made. If however the events unfolding differ significantly from the 'mental plot', it is vital that the conflict be resolved as soon as possible.
>
> It may be that the progress of the operation is being affected by factors not known to the PM, or it could be that the PF is not aware of an impending problem, which may affect the safety of the flight. In either case, the doubt shall be verbalised, and the conflict resolved in order that a smooth, efficient, and safe team effort can be resumed.

The IATA guidance document also highlighted the importance of callouts in achieving and maintaining a stable approach:

> In order to achieve and maintain a stable approach, pilots must be constantly aware of each of the required parameters throughout the approach. A 'callout' is required if either pilot observes a deviation from the specified limits of the stabilization criteria or a deviation from the SOPs ... Each callout requires a corresponding acknowledgement from the other pilot, which can also assist in the early detection of pilot incapacitation. The timely standard and the routine use of callouts in this manner improves communication and enhances situational awareness throughout the approach. It also encourages effective flight management and rapid error correction.

Guidance material for Part 121.200 from *CASR Part 121 AMC/GM - Australian air transport operations—larger aeroplanes* discussed avoiding situations that may lead to an unstable approach, such as discontinuing an approach once visual:

> Some situations that reduce the likelihood of a stabilised approach include:
>
> - circling approaches
> - discontinuing an approach before the minima/MAPT to continue in VMC
> - instrument approaches flown with 'step-down' segments instead of a continuous descent
> - low level circuits.
>
> These circumstances should be avoided when they are not operationally necessary, or where other more suitable procedures exist.

Additionally, the IATA guidance document identified that to mitigate an unstable approach, it was important for flight crew:

> To prepare for visual approaches by briefing speed/altitude/configuration gates, equivalent to those of an instrument approach and follow the published 'visual approach' pattern in the manufacturer's or operator's SOP

Safety analysis

Although the crew had briefed and were cleared to fly the instrument landing system (ILS) approach, the PF descended the aircraft significantly below the 3° glideslope and remained more than half scale deflection below the glideslope. This was contrary to the AIP requirements which required that the aircraft remain within a half scale deflection of the glideslope. Shortly after deviating beyond half scale deflection, the aircraft triggered a minimum safe altitude warning (MSAW), which led to the crew being advised by ATC that they were below glideslope. Despite this, the aircraft remained more than half scale deflection below the glideslope for a 5 NM (9.3 km) segment of the approach.

The PM reported that as the aircraft became visual, they transitioned to a visual approach and were not monitoring the glideslope. Consequently, when the aircraft's flight path deviated beyond half scale deflection, this was not detected or challenged. A change to a visual approach required a clearance from ATC which was not obtained. In addition, the operator required that the glideslope be used for approach guidance when conducting a visual approach. The operator further required that a brief be conducted prior to the commencement of a visual approach and neither crew member reported that this occurred. It is likely that as the PF reported they were complying with the ILS approach and the PM considered they were flying a visual approach there was no shared mental model between the crew of the approach being flown.

The ATSB determined that there were areas of inconsistency within the operator's SOPs relating to approach procedures in visual conditions. The procedures allowed the flight crew to discontinue an instrument approach if the aircraft became visual, and required that the crew brief whenever their intentions were changed. However, there was no specific requirement that an instrument approach could not be discontinued unless the change had been briefed, nor that discontinuing the approach should be briefed at the top of descent if there was a likelihood of the aircraft becoming visual. Discontinuing an instrument approach to continue visually was also contrary to Civil Aviation Safety Regulations (CASR) Part 121 guidance material advice that such circumstances should be avoided to reduce the likelihood of an unstable approach.

In addition, the instrument approach procedure required the crew to continue making glideslope deviation calls to 100 ft above the threshold, even if the aircraft entered visual conditions, whereas the visual approach procedure removed this requirement. Despite this, the operator required that approach guidance must be used where available during a visual approach. Not making glideslope deviation calls limited the effectiveness of the pilot monitoring in managing the stability of the approach and reduced the safety benefits offered by a multi-crew environment.

The ATSB also identified that the Airservices Aeronautical Information Publication (AIP) section regarding flight tolerances when conducting a precision approach was unclear as to whether the tolerances were a requirement or a recommendation.

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 descent below glideslope involving Fairchild SA227-DC, VH-VEU about 17 km north-east of Brisbane Airport, Queensland on 2 July 2024.

Contributing factors

- The pilot flying descended the aircraft significantly below the 3° glideslope after briefing and receiving a clearance for an instrument landing system approach. During the deviation, the aircraft's descent rate and altitude triggered an air traffic control minimum safe altitude warning.
- The pilot monitoring was not monitoring the glideslope and did not challenge the pilot flying to correct the deviation and reduce the aircraft's descent rate.
- Corporate Air's standard operating procedures contained areas of inconsistency when an aircraft entered visual conditions during an instrument approach.

Other factor that increased risk

- The Aeronautical Information Package (AIP) was unclear as to whether pilots were required to comply with precision approach flight tolerances.

Safety actions

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. All of the directly involved parties are invited to provide submissions to this draft report. As part of that process, each organisation is asked to communicate what safety actions, if any, they have carried out to reduce the risk associated with this type of occurrences in the future. The ATSB has so far been advised of the following proactive safety action in response to this occurrence.

Safety action by Corporate Air

Corporate Air made the following changes to its standard operating procedures after the incident:

- the instrument approach procedure has been updated:
  - the approach brief now requires discussion of expectations if visual conditions arise
  - the statement that 'during a visual approach using the ILS, the glideslope calls do not need to be given' has been removed
  - a requirement to make callouts using reference to visual slope indications has been added.
- a note has been added to the visual approach procedures stating that crew require a clearance to discontinue an instrument approach in controlled airspace
- increased focus on pilot monitoring skills during:
  - proficiency checks, which will now include standard instrument departure and standard arrival routes
  - line training for new flight crew.
- addition of a pilot monitoring sector to the annual line check.

Safety action by the Civil Aviation Safety Authority

The Civil Aviation Safety Authority advised that it will be amending information regarding precision approach flight tolerances in the Aeronautical Information Package to include clearer links to existing legislative requirements and the use of defined terms.

General details

Occurrence details

Date and time:	2 July 2024 15:29 Eastern Standard Time	
Occurrence class:	Incident	
Occurrence categories:	Operational non-compliance	
Location:	About 17 km north-east of Brisbane Airport, Queensland	
	Latitude: 27.2536° S	Longitude: 153.2001° E

Aircraft details

Manufacturer and model:	Fairchild Industries SA227-DC	
Registration:	VH-VEU	
Operator:	Vee H Aviation Pty Ltd (operating as Corporate Air)	
Serial number:	DC-797B	
Type of operation:	Part 121 Australian air transport operations – Larger aeroplanes	
Activity:	Commercial air transport - Non-scheduled - Passenger transport charters	
Departure:	Cobar Regional Airport, New South Wales	
Destination:	Brisbane Airport, Queensland	
Persons on board:	Crew – 2	Passengers – 10
Injuries:	Crew – Nil	Passengers – Nil
Aircraft damage:	None	

Sources and submissions

Sources of information

The sources of information during the investigation included:

- the flight crew and operator
- Bureau of Meteorology
- Civil Aviation Safety Authority
- Airservices Australia
- Brisbane Airport.

References

Civil Aviation Safety Authority, 2023, Civil Aviation Safety Regulations (CASR) Part 121 Acceptable Means of Compliance and Guidance Material (AMC/GM) – Australian air transport operations—larger aeroplanes

International Air Transport Association, 2017, Unstable Approaches – Risk Mitigation Policies, Procedures and Best Practices (3rd Edition)

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:

- the operator
- the flight crew
- Civil Aviation Safety Authority
- Airservices Australia.

Submissions were received from:

- the operator
- the flight crew
- Civil Aviation Safety Authority

The submissions were reviewed and, where considered appropriate, the text of the report was amended accordingly.

Australian Transport Safety Bureau

About the ATSB

The ATSB is an independent Commonwealth Government statutory agency. It is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers.

The ATSB's purpose is to improve the safety of, and public confidence in, aviation, rail and marine transport through:

- independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis and research
- 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, as well as participating in overseas investigations involving Australian-registered aircraft and ships. It prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

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

Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining 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. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

Terminology

An explanation of terminology used in ATSB investigation reports is available on the ATSB website. This includes terms such as occurrence, contributing factor, other factor that increased risk, and safety issue.