Australian Government
Australian Transport Safety Bureau

Flight instrumentation failure and descent below glideslope involving SAAB 340, VH-VEQ

9 km south of Sydney Airport, New South Wales, on 24 October 2022

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

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Interim report

This interim report details factual information established in the investigation's evidence collection phase and has been prepared to provide timely information to the industry and public. Interim reports contain no analysis or findings, which will be detailed in the investigation's final report. The information contained in this interim report is released in accordance with section 25 of the *Transport Safety Investigation Act 2003*.

The occurrence

On the evening of 24 October 2022 a Link Airways SAAB 340, registered VH-VEQ operated an air transport flight from Canberra, Australian Capital Territory to Sydney, New South Wales.[1] The captain was acting as pilot flying, and the first officer as pilot monitoring.[2]

At 1944 local time, as the aircraft approached Sydney, air traffic control cleared the aircraft for the instrument landing system (ILS) approach to runway 34 left via the waypoint SOSIJ. This was the first ILS approach conducted in the aircraft on that day, with the captain acting as pilot flying.

Unknown to the crew, and prior to commencing the approach, a fault within the left (captain's) display processor unit[3] resulted in the captain's electronic attitude director indicator (EADI) erroneously presenting a constant 'on glideslope'[4] indication regardless of the aircraft's altitude relative to the glideslope and without an EADI glideslope failure indication. Audio from the cockpit voice recorder and flight crew interviews indicated that the first officer's EADI also probably presented similar erroneous information intermittently and without a failure indication.[5] The EADI localiser[6] course deviation and standby attitude direction indications were not affected.

As the aircraft approached SOSIJ in cloud, at night and with the autopilot engaged, the crew commenced a 90° left turn to intercept the localiser (Figure 1). The aircraft subsequently intercepted the localiser at an altitude and distance from the runway that positioned it close to being on the glideslope for the runway 34 ILS approach. The crew continued the approach using the autopilot and observed that the aircraft did not commence descending as expected to maintain the glidepath. In response, the captain disconnected the autopilot and manually increased the descent rate to that expected for the approach.

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1 The flight was operated under Civil Aviation Safety Regulations Part 121 (Air transport operations - larger aeroplanes).

2 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.

3 The display processor unit receives data from the aircraft's systems and generates the text, colours, and symbols for presentation on the electronic attitude director indicator.

4 Glideslope: Electronic signals that provide vertical approach guidance on aircraft instrumentation.

5 The flight data recorder captured the glideslope indication on the captain's EADI but did not record those presented on the first officers EADI.

6 Localiser: Electronic signals that provide lateral approach guidance on aircraft instrumentation.

Figure 1: Flight path of approach

Source: Recorded flight data and Google Earth, annotated by ATSB

When the aircraft was about 5 nm from the runway, the crew conducted an altitude and distance check which showed that the aircraft was close to the glideslope. As the aircraft descended below 1,373 ft above mean sea level (AMSL) at 1,920 feet per minute, and with the erroneous 'on-glideslope' indication still present, the captain re-engaged the autopilot. The autopilot maintained this descent rate, resulting in the aircraft deviating significantly below the glideslope.

As the aircraft descended below 1,000 ft AMSL, the crew recognised that the approach was unstable due to the flaps not being in the required position. At about the same time, the ground proximity warning system activated to alert the crew to the glideslope deviation and, in response, the crew commenced a missed approach.

Following the missed approach, the crew carried out a required navigation performance approach to the runway and landed without further incident.

Further investigation

To date, the ATSB has:

- interviewed the flight crew
- examined operational and maintenance records
- undertaken analysis of flight and cockpit voice recorder data
- obtained flight data analysis from the aircraft manufacturer
- obtained detailed information on the failed display processor unit.

The ATSB is awaiting additional analysis from an external party and is unable to progress the investigation further until that analysis has been received. As a result, the investigation has been deferred. Once that analysis has been received, the ATSB will recommence the investigation.

A final report will be released at the conclusion of the investigation. Should a critical safety issue be identified during the course of the investigation, the ATSB will immediately notify relevant parties so appropriate and timely safety action can be taken.

General details

Occurrence details

Date and time:	24 October 2022 – 1950 Eastern Daylight-saving Time	
Occurrence class:	Incident	
Occurrence categories:	Flight below minimum altitude, technical failure - electrical discontinuity	
Location:	9 km south of Sydney, New South Wales	
	Latitude: 34.025º S	Longitude: 151.196º E

Aircraft details

Manufacturer and model:	SAAB 340B	
Registration:	VH-VEQ	
Operator:	Vee H Aviation Pty Ltd operating as Link Airways	
Serial number:	340B-424	
Type of operation:	Air transport operations – larger aeroplanes (CASR Part 121)	
Departure:	Canberra, Australian Capital Territory	
Destination:	Sydney, New South Wales	
Persons on board:	Crew – 3	Passengers – Unknown
Injuries:	Crew – None	Passengers – None
Aircraft damage:	None	

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.