



Australian Government

Australian Transport Safety Bureau

Air traffic control error involving Boeing 737, VH-YFT

Near Armidale, New South Wales on 19 October 2022

ATSB Transport Safety Report

Aviation Occurrence Investigation (Short)

AO-2022-052

Final – 6 June 2023

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

Published by Australian Transport Safety Bureau
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Addendum

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Executive summary

What happened

On 19 October 2022, a Boeing 737-8FE aircraft, registered VH-YFT and operated by Virgin Australia, departed Brisbane, Queensland on a scheduled passenger flight to Sydney, New South Wales. After the aircraft reached top of descent, the crew contacted air traffic control (ATC) and were issued a clearance for a standard arrival to land on runway 34L in Sydney. However, runway 16L was operational at the time. When the crew transferred to Sydney Approach, they were instructed to expect runway 16L. While this initially led to some confusion between the crew and ATC, the correct runway was established, and the crew performed an independent visual approach to runway 16L.

What the ATSB found

The ATSB found that an incorrect clearance was verbally communicated to VA942, which was not identified by the enroute air traffic controller or the crew during the read-back or hear-back. This error likely occurred due to momentary interference of related, coinciding information about the assigned flight level (FL 340) and the runway (34L).

However, the information entered into the air traffic management system was correct. Consequently, the approach controller identified and rectified the error with the crew of VA942, well before an undesirable state for landing had the opportunity to develop.

Safety message

Slips in verbal communication can happen at any time. They can pose a threat to safe operations if the content of the message is inaccurate, and then not identified during the read-back or hear-back process.

Pilots and air traffic controllers are reminded to seek verification when there is confusion or a misunderstanding on any information in a clearance that conflicts with other information they have previously received and understood.

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 19 October 2022, at 0148 Coordinated Universal Time (UTC), a Boeing 737-8FE aircraft, registered VH-YFT and operated by Virgin Australia as flight number VA942, departed Brisbane Airport, Queensland, on a domestic scheduled passenger flight to Sydney, New South Wales (Figure 1).

At about 0220, the flight crew contacted air traffic control and advised they were maintaining FL 340.¹ The enroute controller issued the flight crew a BOREE 3 ALPHA standard instrument arrival (STAR)² for runway 34L.³ The flight crew read this clearance back to the controller, including runway 34L.

The enroute controller later advised the flight crew that the Sydney Airport automatic terminal information service (ATIS)⁴ had been amended. However, both the original and amended ATIS indicated that runways 16L and 16R were in operation for arrivals and departures.

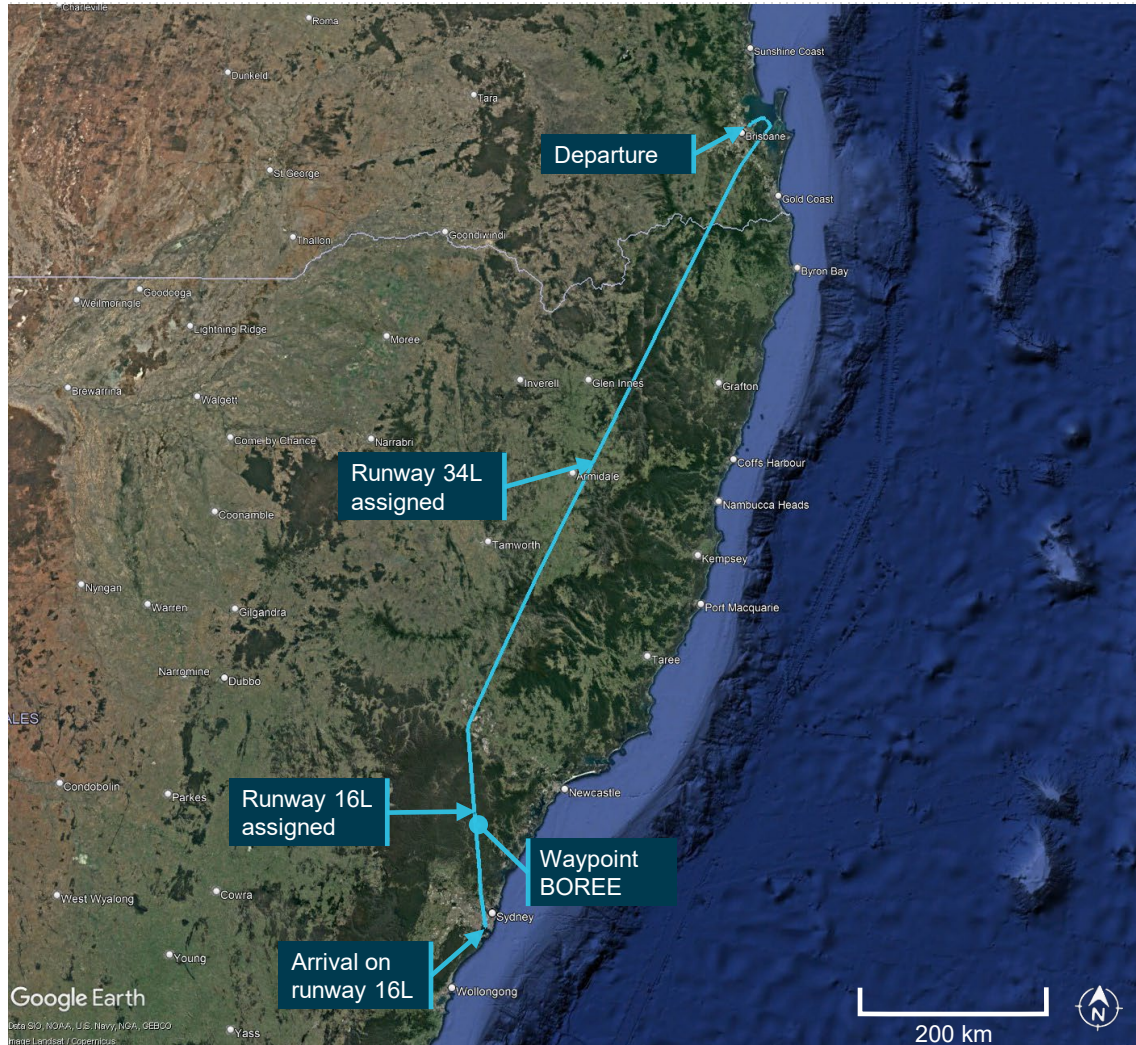
During the descent, the crew contacted Sydney Approach, informing them they were on descent to 10,000 ft and acknowledged receipt of the current ATIS. At this point, the aircraft was at about 17,275 ft and 6 NM from waypoint⁵ BOREE. The approach controller replied, confirming runway 16L and to expect an independent visual approach⁶ via the STAR to 6,000 ft.

Immediately, the crew questioned the runway assignment informing the approach controller they had been assigned 34L, rather than 16L. The approach controller confirmed that runways 16L and 16R were in operation, and that 16L had been assigned. The flight crew accepted runway 16L, and the approach controller advised the crew that ‘...if you do need some extra track miles to get down to let me know [to] give you some vectors.’ The aircraft continued as cleared and joined the approach as normal.

At about 0245, the approach controller contacted the enroute controller and notified them that VA942 had been incorrectly issued runway 34L. The enroute controller then checked their recorded radio transmissions. They then verified with another aircraft, also recently issued the BOREE 3A Arrival, that they had been assigned 16L, as intended.

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- ¹ Flight level: At altitudes above 10,000 ft in Australia, an aircraft’s height above mean sea level is referred to as a flight level (FL). FL 340 equates to 34,000 ft.
- ² Standard instrument arrival (STAR): A designated IFR arrival route linking a significant point, normally on a ATS route, with a point from which a published instrument approach procedure can be commenced.
- ³ Runway number: the number represents the magnetic heading of the runway. The runway identification may include L, R or C as required for left, right or centre.
- ⁴ Automatic Terminal Information Service (ATIS): A continued and repetitive voice frequency broadcast, which contains standard operational information such as the type of approaches to expect, the runways in use, and weather conditions. Updated ATIS information is labelled in terms of ascending phonetic code letters and pilots confirm with ATC that they have received and understood the most up to date information.
- ⁵ Waypoint: A defined position of latitude and longitude coordinates, primarily used for navigation.
- ⁶ Independent visual approach (IVA): A procedure to parallel or near-parallel runways which allows a visual approach to one runway independently of approaches occurring on an adjacent parallel or near parallel runway.

Figure 1: Flight path of VA942 with respect to when the runway was assigned.



Source: FlightAware and Google Earth, annotated by ATSB.

Context

Enroute controller

The enroute controller had about 24 years' experience and was rated, endorsed, and fulfilled all recency requirements. They were responsible for 2 adjacent sectors during their shift.

Work schedule

The enroute controller reported fit for duty for their planned 8-hour shift at 0530 local time, with a scheduled shift end time of 1330. In the previous 3 weeks, the enroute controller had accepted some additional overtime shifts and extended shifts. They reported obtaining good quality 6-7 hours sleep the night before, and their usual sleep in the previous 72 hours.

The error occurred approximately 10 minutes prior to their scheduled shift end time, and the controller reported feeling 'fully alert' at the time. After the occurrence, the work scheduling software indicated that the shift had a predicted fatigue level of high.⁷ However, fatigue was not considered to be a contributing factor.

⁷ 'Predicted Fatigue Level' is defined in the Air Traffic Services (ATS) Fatigue Risk Management Procedure, and includes current and future predicted fatigue level, based upon tactical roster management principals.

Workload

It was reported that the sector was fully staffed that day, with provision for in-shift relief breaks. The controller advised they were ‘relatively busy’ and were communicating with 10 other aircraft around the time of the occurrence. They estimated that they were operating at a capacity of about ‘six out of ten’. Overall, the workload across the 2 sectors was manageable at the time of the occurrence, and not considered to be a contributing factor.

Issuing of clearance

The enroute controller for this sector provided initial sequencing, STAR clearances, and initial descent instructions for aircraft bound for Sydney Airport from the MAESTRO system. MAESTRO is a tactical traffic sequencing software used for aircraft arrivals at Sydney Airport, and other domestic airports across Australia. It uses actual position and speed information of aircraft to determine the landing order and displays this information to air traffic controllers. This information can then be used to inform decisions about aircraft speed control, vectoring or holding to maintain an orderly traffic flow.

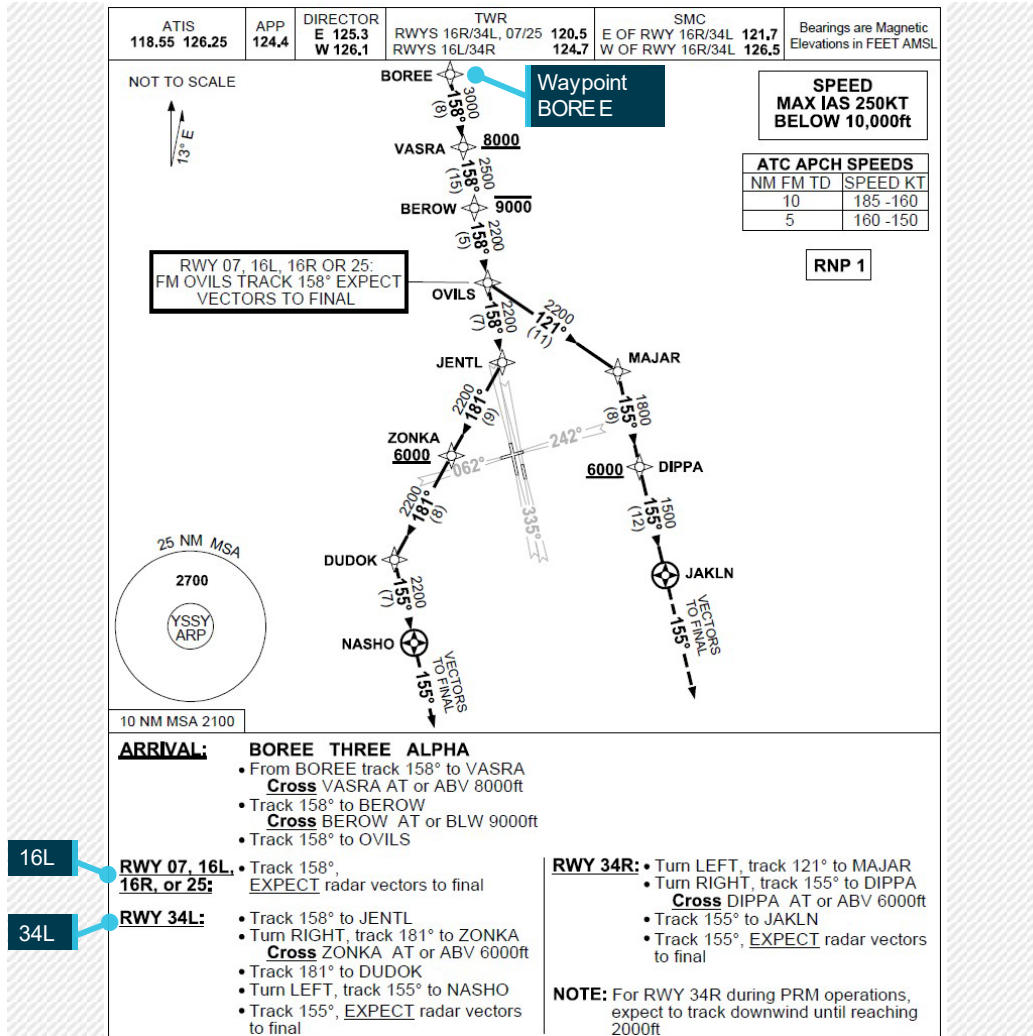
When the enroute controller issues a clearance to aircraft, they check the runway allocation in MAESTRO, then select the aircraft designator on the air situation display (ASD), which opens a drop-down list of runways. The controller then selects the issued runway on the ASD and during the hear-back process, checks that all the information is correct. The aircraft designator also displays other information, including the aircraft’s flight level.

At the time of the occurrence, the ASD and MAESTRO displayed flight VA942 assigned for runway 16L and maintaining FL 340. The enroute controller issued the clearance using the standard phraseology, and reported they were looking at the flight level in the aircraft designator when they did this.

Standard Terminal Arrival Route (STAR) clearance

The BOREE 3A arrival positioned aircraft to receive radar vectors to final for all Sydney Airport runways, including 16L and 34L. Waypoint BOREE is the initial approach fix, and the track then later branches for the different runways at waypoint OVILS (Figure 2). The crew reached waypoint BOREE about one minute after the correct runway was confirmed, which required that the approach be re-briefed by the crew. In this case, the change to the approach required that the aircraft fly the procedure as briefed to OVILS where radar vectors would then be provided by ATC.

Figure 2: BOREE 3A Arrival STAR Chart



Source Airservices Australia, annotated by ATSB.

Virgin Australia procedures

Virgin Australia’s flight procedures for the verification of weather and terminal information included a requirement for flight crew to independently review information from the ATIS during arrival preparations.

Virgin Australia did not specifically mandate flight crews to conduct a cross check between the clearance and ATIS. They reported that this would be difficult to implement due to several factors:

- STARs can be issued at various distances depending on the destination
- STARs can be received before the ATIS information is received
- ATIS can’t be specified at set distances, due to the operational mix of aircraft communication addressing and reporting system (ACARS)⁸ and non-ACARS aircraft
- dynamic runway changes can occur without notice, or without it highlighted in the ATIS information (e.g., ‘from time XXX expect RWY xx’)

⁸ Aircraft Communications Addressing and Reporting System (ACARS): digital data link system for the transmission of messages between aircraft and ground stations.

During the enroute phase of the flight, the enroute controller notified the crew of the ATIS update from 'X-ray' to 'Yankee'. Both transmissions listed 'RWY: 16L AND R FOR ARRS AND DEPS'.

The enroute controller later advised they were 'surprised' that the crew did not question the runway assignment during the read-back process, because the assigned runway was different to that stated in the ATIS.

Safety analysis

The enroute controller reported that when the crew of VA942 initially made contact and the STAR was provided, runway 16L was selected from the available runways as intended. However, they were looking at the flight level (FL 340) on the ASD, when they issued the clearance for 34L. This skill-based error most likely occurred because of the interference of information between FL 340 and 34L. Verbal slips of this nature are more likely to occur when there is a high degree of similarity between the presentation of simultaneous, related information, while performing a familiar and repetitive action.

The read-back and hear-back procedure was the opportunity for both parties to detect the error before it propagated further. However, on this occasion the error went undetected. The radio recordings confirmed that the standard phraseology was used during the communication, and the flight crew correctly read-back the assigned runway 34L, and this was acknowledged by the enroute controller.

There was information available to the crew in the ATIS indicating that runway 34L was not in operation. This provided an opportunity to identify and question the conflicting clearance and ATIS information between themselves, but the evidence obtained by ATSB showed that they did not enquire further with ATC until they were in contact with the approach controller, who correctly assigned 16L.

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 air traffic control error involving Boeing 737, VH-YFT, near Sydney Airport, New South Wales on 19 October 2022.

Contributing factors

- The enroute controller verbally issued the clearance to the flight crew to land on runway 34L instead of 16L, which was not identified during readback. This slip was likely due to the similarity between the flight level (FL 340) and runway 34L.

Other findings

- The flight crew did not enquire further with ATC about the runway assignment of 34L until the approach controller provided runway 16L.

General details

Occurrence details

Date and time	19 October 2022 0220 UTC	
Occurrence class	Incident	
Occurrence categories	Information / Procedural error, Air-ground-air	
Location	near Armidale New South Wales	
	Latitude 30° 24.6725 S	Longitude 151° 52.2482 E

Aircraft details

Manufacturer and model	The Boeing Company 737-8FE	
Registration	VH-YFT	
Operator	Virgin Australia Airlines Pty Ltd	
Serial number	41028	
Type of operation	Part 121 Australian air transport operations - Larger aeroplanes-Standard Part 121	
Activity	Commercial air transport-Scheduled-Domestic	
Departure	Brisbane Airport, Queensland	
Destination	Sydney Airport, New South Wales	
Persons on board	Unknown	Unknown
Injuries	Crew - Nil	Passengers - Nil
Aircraft damage	None	

Sources and submissions

Sources of information

The sources of information during the investigation included:

- the involved air traffic controllers
- FlightAware
- Airservices Australia
- Virgin Australia Airlines Pty Ltd
- VATPAC ATC Standard Operating Procedures Hub

References

Safety behaviours: human factors for pilots 2nd edition. Resource booklet 4 Communication. Civil Aviation Safety Authority

Air Traffic Flow Management: Harmony for ANSPs. Briefing Paper for Pilots. Version 5. Air Services Australia 2016.

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 involved air traffic controllers
- Airservices Australia
- Virgin Australia Airlines Pty Ltd

No submissions were received.

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.