

Final Report

AIRBUS A350-900, REGISTRATION 9V-SHJ TURBULENCE ENCOUNTER

14 NOVEMBER 2025

TIB/AAI/CAS.255

Transport Safety Investigation Bureau
Ministry of Transport
Singapore

5 October 2026

The Transport Safety Investigation Bureau of Singapore

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ABBREVIATIONS

ATC	Air Traffic Control
CVR	Cockpit Voice Recorder
DFDR	Digital Flight Data Recorder
FCTM	Flight Crew Techniques Manual
FIR	Flight Information Region
ND	Navigational Display
PF	Pilot Flying
PIC	Pilot-in-Command
PM	Pilot Monitoring
SFO	Senior First Officer
WXR	Weather Radar

SYNOPSIS

On 14 November 2025, an Airbus A350-900 passenger flight encountered turbulence while flying from Manila, the Philippines, to Singapore. A cabin crew member sustained a fractured right ankle during the turbulence.

The Transport Safety Investigation Bureau of Singapore has classified this occurrence as an accident.

FLIGHT DETAILS

Aircraft type	:	Airbus A350-900
Operator	:	Singapore Airlines
Aircraft registration	:	9V-SHJ
Date and time of incident	:	14 November 2025, about 1152UTC
Location of occurrence	:	Enroute from Manila, the Philippines, to Singapore
Type of flight	:	Schedule
Persons on board	:	286 passengers and 14 crew members

1 **FACTUAL INFORMATION**

All times used in this report are Coordinated Universal Time (UTC) unless otherwise stated.

1.1 History of the flight

1.1.1 At about 0927hrs on 14 November 2025, an Airbus 350-900 aircraft departed Manila, the Philippines, for Singapore. The flight crew comprised a Pilot-in-Command (PIC), who was the Pilot Flying (PF), and a Senior First Officer (SFO), who was the Pilot Monitoring (PM). The estimated flight time was 2 hours 55 minutes.

1.1.2 Prior to the flight, the flight crew reviewed the pre-flight briefing package. The weather prognostic chart (see Figure 1) forecasted occasional cumulonimbus clouds (OCNL CB)¹ for the area from the Philippines to Singapore, with cloud tops height of up to 51,000 feet (more on weather prognostic chart in paragraph 1.5.2.1). The Electronic Weather Awareness System (eWAS), an application on the flight crew's mobile tablets, highlighted that they could expect to encounter some weather during the second half of the flight, i.e. from about 1120hrs² onwards. The flight crew shared this assessment with the Cabin Crew-in-Charge during the pre-flight briefing.

¹ ONCL CB means Cumulonimbus cloud with maximum spatial coverage between 50% and 75% within the specified area.

² This was night time at the location of the accident.



(Source: Operator) (Annotation: TSIB)

Figure 1: Weather prognostic chart extracted from pre-flight briefing package

1.1.3 At about 1140hrs, while the aircraft was cruising at 40,000 feet, the flight crew observed weather about 80 nautical miles (nm) ahead of them denoted by striped pattern green weather returns³ on their Navigational Displays (NDs). After assessing the weather returns, the flight crew concluded that:

- (a) The top of the weather was at about 30,000 feet⁴.
- (b) They could continue their planned route and there was no need for a lateral or vertical deviation from the weather. This was because the aircraft was 10,000 feet above the top of the weather, which was more than the 5,000 feet vertical avoidance margin recommended by the

³ The striped pattern weather returns, also known as the off-path weather returns, indicate that the weather is either more than 4,000 feet above or below the aircraft's cruising level, i.e. above 44,000 feet or below 36,000 feet in this case.

⁴ The flight crew used the "Elevation" (ELEVN) function of the weather radar (WXR) to estimate the top of the weather.

aircraft manufacturer for avoiding the “area of greatest threat” for weather (see paragraph 1.7.1.1).

- 1.1.4 Notwithstanding paragraph 1.1.3(b), as a precautionary measure the flight crew switched on the fasten-seat-belt signs to get the passengers seated. They also made a public announcement informing the passengers that the seat belt sign had been turned on and advising the cabin crew to proceed with their service with caution. The flight crew then continued their flight on the planned route without any deviation.
- 1.1.5 At about 1151hrs, the flight crew was instructed by the Air Traffic Control (ATC) to descend from 40,000 feet to 34,000 feet. At this time, the flight crew estimated that they were about 20nm before the start of the striped pattern green weather returns. The flight crew reassessed the weather returns and concluded as before (see paragraph 1.1.3) that the top of the weather was at about 30,000 feet.
- 1.1.6 As instructed by the ATC, the flight crew started descending the aircraft from 40,000 feet towards 34,000 feet. The PF set a descent rate of 700ft/min which was a shallower descent rate than normal. The usual descent rate of about 1,000ft/min would make the aircraft descend faster and fly closer above the weather earlier. This shallower descent, while increasing the time needed for the aircraft to reach 34,000 feet, would allow the aircraft to pass above the weather at about 37,000 feet, more than 5,000 feet above the weather.
- 1.1.7 At about 1153hrs, as the aircraft was descending past 38,450 feet, and over the area of striped pattern green weather returns, the aircraft encountered turbulence. Data from the digital flight data recorder (DFDR) showed that the vertical acceleration decreased from +1G to +0.7G in 1.34 seconds, then increased to +1.89G in 0.34 seconds. The vertical acceleration then fluctuated between +1.89G and +1.5G for the next 1.25 seconds before reaching +1.66G at the end of the 1.25-second period. It then decreased from +1.66G to +0.24G in 1.25 seconds. The vertical acceleration stabilised at +1G after another 2 seconds. The autopilot remained engaged throughout the turbulence encounter.
- 1.1.8 According to the PF, the aircraft was not flying in cloud prior to the turbulence encounter. Despite operating in hours of darkness, he could see clouds below the aircraft and stars in the sky. He did not see clouds above the aircraft.

1.1.9 The aircraft continued to Singapore and landed at about 1241hrs without further incident.

1.2 Injuries to persons

Injuries	Flight crew	Cabin Crew	Passengers	Total
Fatal	0	0	0	0
Serious	0	1 ⁵	0	1
Minor	0	4	0	4
Uninjured	2	7	286	295
Total	2	12	286	300

1.3 Damage to aircraft

1.3.1 There was no damage to the aircraft.

1.4 Personnel information

1.4.1 PIC

Age	46
Licence type	Airline Transport Pilot Licence
Issuing authority	Civil Aviation Authority of Singapore
Licence validity date	Valid till 31 May 2026
Medical certificate	Class 1
Medical certificate validity	Valid till 31 May 2026
Medical operational proviso	Nil
Last Base Check date	4 February 2025
Last Line Check date	30 April 2025
Total flying hours	13,938 hrs
Aircraft types flown	Boeing B777, Airbus A330 & A350
Total hours on type	B777 – 4,267 hours A330 – 2,012 hours A350 – 7,659 hours
Flying in last 90 days	249 hours 25 minutes
Flying in last 7 days	16 hours 13 minutes

⁵ Fractured right ankle.

Flying in last 24 hours	7 hours 21 minutes
Duty time in last 48 hours	10 hours 5 minutes
Rest period in last 48 hours	37 hours 55 minutes

1.4.2 SFO

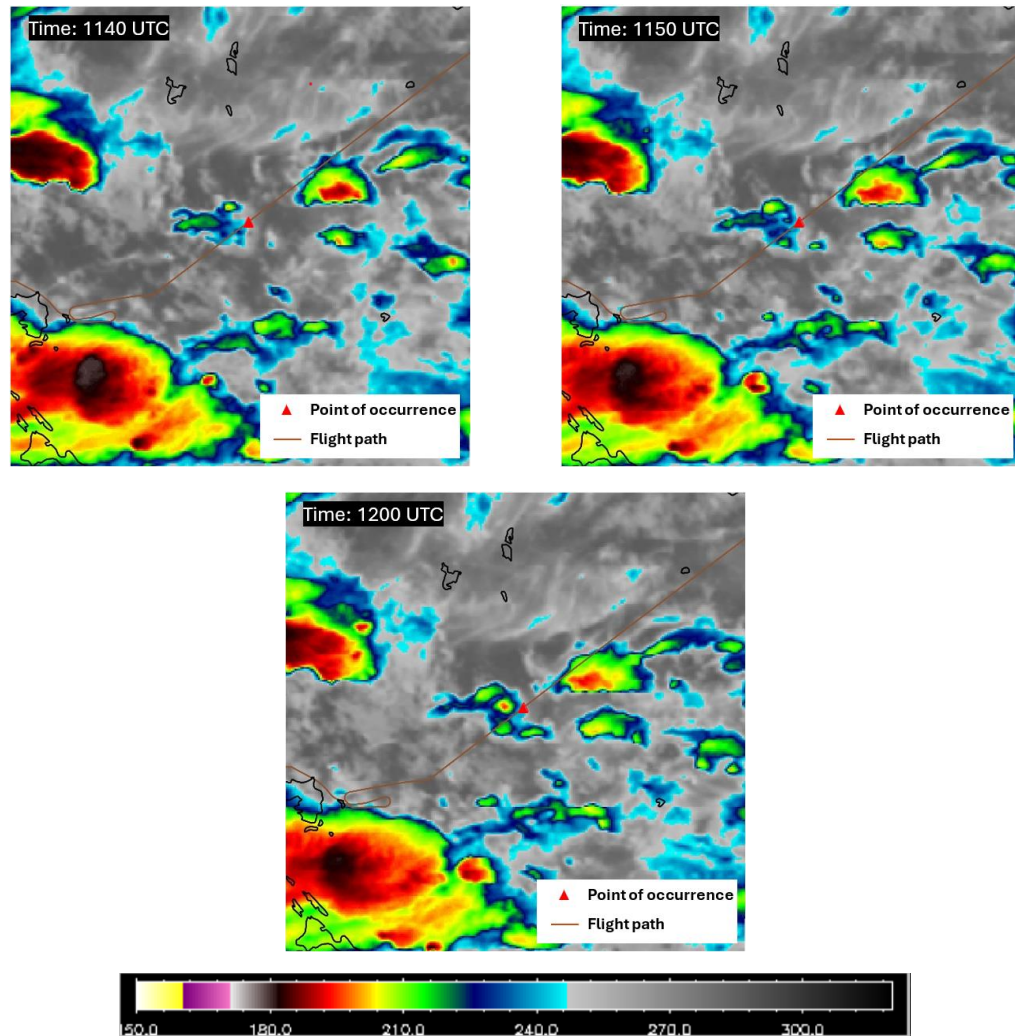
Age	42 years
Licence type	Airline Transport Pilot Licence
Issuing authority	Civil Aviation Authority of Singapore
Licence validity	Valid till 30 April 2026
Medical certificate	Class 1
Medical certificate validity	Valid till 30 April 2026
Medical operational proviso	Holder shall wear corrective lenses that correct for distant vision and shall have available a second pair of spectacles whilst exercising the privileges of the licence.
Last Base Check date	29 April 2025
Last Line Check date	1 June 2025
Total flying hours	9,599 hrs
Aircraft types flown	Boeing B777 & B787, Airbus A350
Total hours on type	B777 – 4,121 hours B787 – 2,418 hours A350 – 3,060 hours
Flying in last 90 days	269 hours 40 minutes
Flying in last 7 days	22 hours 21 minutes
Flying in last 24 hours	7 hours 21 minutes
Duty time in last 48 hours	10 hours 5 minutes
Rest period in last 48 hours	37 hours 55 minutes

1.5 Meteorological information

- 1.5.1 According to the Meteorological Service Singapore (MSS), the satellite images⁶ (see **Figure 2**) and ground WXR image⁷ (see **Figure 3**) indicated that the aircraft was in the vicinity of convective activity at the time the turbulence occurred.

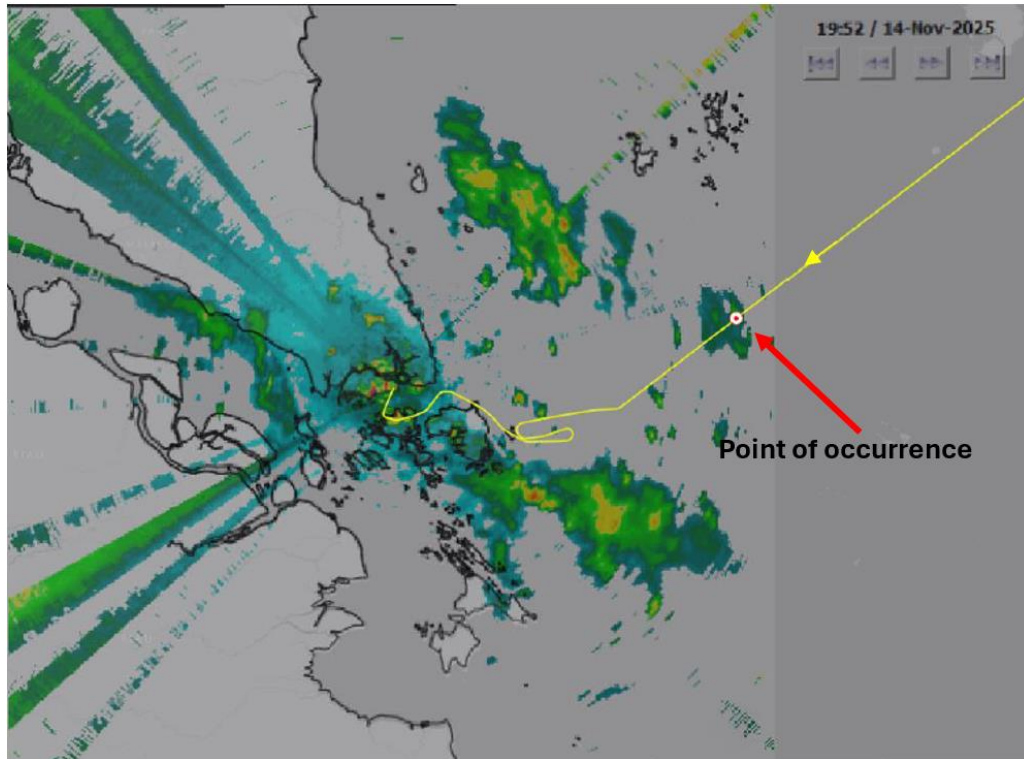
⁶ Satellite infrared image is used to estimate cloud-top temperature. In such images, lighter blue shades indicate relatively warmer cloud tops, while darker red shades indicate relatively colder cloud tops.

⁷ Ground WXR images show precipitation levels, i.e. intensity of rain. Green is lower intensity and red is higher intensity.



(Source: MSS) (Annotation: TSIB)

Figure 2: Infrared (temperature) images from geostationary weather satellite at 1140 UTC, 1150 UTC and 1200 UTC



(Source: MSS) (Annotation: TSIB)

Figure 3: Weather image (precipitation) from Changi ground WXR

1.5.2 Pre-flight briefing pack

1.5.2.1 As mentioned in paragraph 1.1.2, the weather prognostic chart forecasted OCNL CB clouds along the flight path from the Philippines to Singapore, with the top of the clouds extending up to 51,000 feet. The area of forecast was the area outlined by the scalloped lines (see **Figure 1**). This forecast suggested that the CB clouds could cover between 50% and 75% of this entire area but did not indicate where the clouds would be exactly. The forecast would alert flight crews that they might encounter CB clouds within this area and they should use the aircraft WXR or other methods to avoid areas of CB clouds, or decide on the appropriate actions to take if they need to fly through such weather.

1.6 Flight recorders

1.6.1 The DFDR and Cockpit Voice Recorder (CVR) were removed for readout after the aircraft landed in Singapore. The CVR recording around the time of the

turbulence occurrence had been overwritten. Data from the DFDR around the time of the turbulence occurrence was available for analysis.

1.7 Additional information

1.7.1 Flight Crew Techniques Manual (FCTM)

1.7.1.1 The operator's FCTM recommended the following weather avoidance techniques when operating in areas of convective weather:

- (a) If possible, avoid the identified "area of greatest threat" by at least 20nm.
- (b) For vertical avoidance above convective cloud, apply a vertical margin of at least 5,000 feet from the identified "area of greatest threat". Vertical avoidance is in general not recommended as some convective clouds may have a significant and unpredictable build-up speed.

2 ANALYSIS

- 2.1 The data from the satellite images and the ground WXR corroborated with the flight crew account that the aircraft had overflowed an area of convective activity.
- 2.2 At about 1140hrs, while the aircraft was cruising at 40,000 feet, the flight crew observed weather about 80nm ahead of them with cloud top at about 30,000 feet, denoted by striped pattern green weather returns on their NDs. They deemed it was safe to continue on their planned route without deviating. Nevertheless, they exercised prudence in the following ways:
- (a) The flight crew switched on the fasten-seat-belt signs to get the passengers seated. They also advised the cabin crew to proceed with their service with caution.
 - (b) When instructed by ATC to descend from 40,000 feet to 34,000 feet (see paragraph 1.1.6), the flight crew opted for a shallower descent to make sure that the aircraft passed above the observed weather higher than the weather avoidance height of 5,000 feet recommended by the aircraft manufacturer and the operator's FCTM.
- 2.3 Unfortunately, despite these precautions, they could not avoid the turbulence encounter.
- 2.4 This occurrence highlighted that, although the aircraft manufacturer and operator recommend maintaining at least 5,000 feet above observed "area of greatest threat", the effects of convective activity may extend significantly beyond the top of the weather detected by the aircraft WXR and have the potential to adversely affect aircraft flying more than the recommended avoidance height above the weather. Flight crews should remain cognisant of this possibility and exercise additional caution, such as instructing the cabin crew to stop service and be seated, when opting to overfly weather activity.

3 CONCLUSIONS

From the information gathered, the following findings are made. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

- 3.1 At about 1140hrs, while the aircraft was cruising at 40,000 feet, the flight crew observed weather about 80nm ahead of them and displayed on the ND as striped green pattern. The flight crew assessed that the top of the weather was at 30,000 feet.
- 3.2 The flight crew assessed that no lateral deviation was needed, as the aircraft was operating at more than 5,000 feet above when passing the detected weather.
- 3.3 The flight crew exercised prudence by asking the passengers to be seated and fasten their seat belts and conducted a more gradual descent to maintain greater separation from the detected weather. They instructed cabin crew to continue cabin service with caution.
- 3.4 The aircraft encountered convectively induced turbulence, despite flying more than 5,000 feet above the detected weather.
- 3.5 The effects of convective activity may extend above the top of the weather detected by the aircraft WXR and beyond the recommended weather avoidance height of 5,000 feet.

4 SAFETY ACTIONS

Arising from discussions with the investigation team, the organisation has taken the following safety action.

4.1 The operator has taken the following safety actions:

- (a) Flight crews were reminded, on 21 November 2025, to apply the Secure Cabin Procedure (SCP)⁸ whenever, in a PIC's judgement, weather conditions may pose a safety risk. Flight crews should assess the weather during the climb and descent phases and proactively adopt a conservative turbulence management approach by applying SCP whenever necessary.
- (b) Case studies of turbulence-related incidents were shared with the cabin crews on 26 December 2025, and the message reinforced advisories for crew to safeguard their safety when flight conditions make it difficult to continue with duties.
- (c) Flight crews were reminded, on 4 June 2026, that significant turbulence can occur outside identifiable cloud formations. While manufactures provided guidance to maintain a minimum of 20nm laterally or 5,000 feet vertically from the areas of greatest threat, flight crew should be mindful of weather-related turbulence that can exist outside these zones.

⁸ Whenever SCP is practised, the seat belt sign shall be switched ON, and:

- (a) Passengers/cabin occupants are to be seated from:
 - Chocks-off until at least Top-of-climb (TOC) for departure
 - At least from Top-of-descent (TOD) to Chocks-in for arrival
- (b) Cabin crew are to be seated:
 - Once the "Cabin Ready" signal is given until at least Top-of-climb (TOC) for departure
 - At least from Top-of-descent (TOD) to Chocks-in for arrival

SAFETY RECOMMENDATIONS

In view of the safety actions taken by the operator, no safety recommendation is proposed for the operator.