

# **Final Report**

## **Boeing B77W, REGISTRATION B-7868 RUNWAY INCURSION AT CHANGI AIRPORT**

**19 MAY 2025**

TIB/AAI/CAS.247

Transport Safety Investigation Bureau  
Ministry of Transport  
Singapore

6 July 2026

## **The Transport Safety Investigation Bureau of Singapore**

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## ABBREVIATIONS

ASMGCS	Advanced Surface Movement Guidance and Control System
ATC	Air Traffic Control
ATSP	Air Traffic Services Provider
FO	First Officer
ft	feet
ICAO	International Civil Aviation Organization
m	metre
nm	nautical miles
PF	Pilot Flying
PIC	Pilot-in-Command
PM	Pilot Monitoring
RET	Rapid Exit Taxiway
ROT	Runway Occupancy Time
RWC	Runway Controller
SO	Second Officer
VHF	Very High Frequency

## SYNOPSIS

On 19 May 2025, a Boeing B77W (Aircraft A) was on its approach to land on Runway 02L at Changi Airport. A preceding aircraft (Aircraft B) that landed earlier on the same runway had turned onto Rapid Exit Taxiway W5 to vacate the runway.

When Aircraft A was near the runway threshold, the Runway Controller (RWC) assessed that Aircraft B might not be clear of the runway strip<sup>1</sup> by the time Aircraft A landed, so the RWC instructed Aircraft A to go around and provided the altitude and heading for the go-around. The flight crew of Aircraft A could not make out the RWC's communication, likely due to simultaneous radio altitude callouts in the cockpit. The RWC was not aware that the flight crew of Aircraft A had not made out the go-around communication.

Having just instructed Aircraft A to go around, the RWC was monitoring Aircraft A to see if it was executing the go-around instruction. The RWC noticed Aircraft A was in a nose-up attitude, similar to one in a go-around profile. The RWC thought that Aircraft A was initiating the go-around.

When the flight crew of Aircraft A queried the RWC if the earlier communication was for them, the RWC thought that the flight crew were asking for the go-around details, and repeated the go-around altitude and heading. By then, Aircraft A was close to touching down and subsequently landed. At this time, Aircraft B had vacated the runway but was still not clear of the runway strip.

As Aircraft A rolled down the runway, Aircraft B continued taxiing and eventually vacated the runway strip.

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

## AIRCRAFT DETAILS

Aircraft type	:	B77W
Operator	:	China Eastern Airlines
Aircraft registration	:	B-7868
Date and time of incident	:	19 May 2025, 2131LT
Location of occurrence	:	Singapore Changi Airport
Type of flight	:	Scheduled
Persons on board	:	331

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<sup>1</sup> A runway strip is a defined obstacle-free safety buffer zone surrounding the runway.

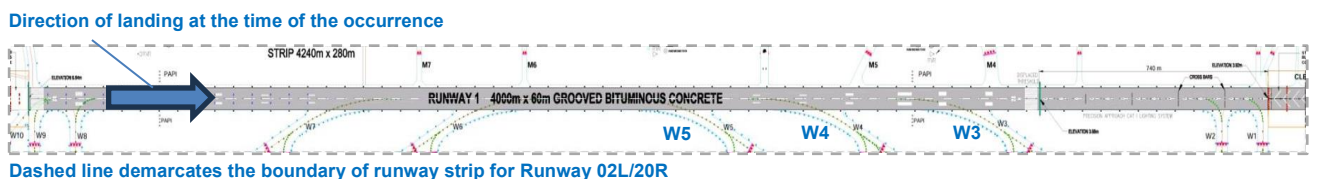
# 1 FACTUAL INFORMATION

All times used in this report are Singapore Local Time. Singapore Local Time is eight hours ahead of Coordinated Universal Time (UTC).

## 1.1 History of the flight

1.1.1 On 19 May 2025, a Boeing B77W aircraft (Aircraft A) operated from Shanghai Pudong International Airport to Singapore Changi Airport. It was assigned to land on Runway 02L, also known as Runway 1 (see **Figure 1**). The flight crew on board Aircraft A comprised:

- (a) a Captain, who was the Pilot-in-Command (PIC) and operating as pilot monitoring (PM);
- (b) a Captain, who was the Co-pilot and operating as Pilot Flying (PF);
- (c) a Second Officer (SO), operating as Communicator and handling communications with air traffic control (ATC); and
- (d) a First Officer (FO), operating as an Observer in the flight deck.



(Source: Singapore Aeronautical Information Publication, 17 April 2025) (Annotation: TSIB)

Figure 1: Layout of Runway 1, RET W5 and runway strip boundary

1.1.2 At 21:31:00 hrs, another aircraft (Aircraft B) that had landed on Runway 02L ahead of Aircraft A turned onto Rapid Exit Taxiway (RET) W5.

1.1.3 At 21:31:05 hrs, Aircraft A was about 300ft above the ground and about 1,800m from the runway threshold when Aircraft B was still taxiing along RET W5. The Runway Controller (RWC) assessed that Aircraft B would be able to vacate the runway strip before Aircraft A landed and issued a landing clearance for Aircraft A to land on Runway 02L. The flight crew of Aircraft A read back the landing clearance.

- 1.1.4 At 21:31:07 hrs, the control screen of the Advanced Surface Movement Guidance and Control System (ASMGCS<sup>2</sup>) displayed a runway incursion message in the form of a warning message (this message was not accompanied by audio alert. See paragraph 1.8.2.3 for details). The warning message highlighted a possibility that an aircraft (i.e. Aircraft B) might not be able to vacate the runway strip before another aircraft (i.e. Aircraft A) lands.
- 1.1.5 At 21:31:11 hrs, the ASMGCS warning message transitioned to an onscreen alarm message (see paragraph 1.8.2.3). This alarm message was accompanied by an audio alert “RUNWAY INCURSION, RUNWAY 1 [momentary pause] RUNWAY INCURSION, RUNWAY 1” broadcasted on the ASMGCS speakers<sup>3</sup>. The RWC was aware of both the ASMGCS warning and alarm messages and was assessing the aircraft separation between Aircraft A and Aircraft B.
- 1.1.6 At 21:31:19 hrs, Aircraft B was still taxiing along RET W5 but was not yet clear of the runway strip. The flight crew of Aircraft B stopped the aircraft momentarily at a Y-junction to seek confirmation from the RWC regarding its taxi route. The RWC repeated the taxi route at 21:31:22 hrs and instructed Aircraft B to vacate RET W5 immediately.
- 1.1.7 At 21:31:28 hrs, with the alarm message still activated, the RWC assessed that Aircraft B would not be able to vacate the runway strip before Aircraft A landed. This prompted the RWC to issue the following instruction to Aircraft A: “China Eastern Five Four Five, due runway occupied, go around, I say again go around, climb two thousand feet continue runway heading”. The RWC finished delivering the go-around instruction at 21:31:32 hrs.
- 1.1.8 At this time, Aircraft A was about 100ft above the ground and 200m before Runway 02L threshold. According to the flight crew of Aircraft A, they could not make out what the RWC was saying and to whom because there were radio altimeter callouts<sup>4</sup> in the cockpit at that time. At 21:31:35 hrs, three seconds after the RWC finished instructing Aircraft A to go around, the flight crew of Aircraft A asked the RWC, “Calling China Eastern Five Four Five?”

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<sup>2</sup> The ASMGCS is a ground surveillance system providing air traffic controllers with routing, guidance and surveillance of aircraft and vehicles. See Section 1.8.2 for more details.

<sup>3</sup> The alarm message serves to alert the RWC that a hazardous situation has developed and an intervention may be required. The alarm message will stay on until the conflicting aircraft has cleared the runway strip.

<sup>4</sup> When the aircraft height is 100ft, 50ft, 40ft, 30ft, 20ft and 10ft above ground, the radio altimeter will automatically generate height callouts (e.g. “One hundred”, “Fifty”, “Forty”, etc.), which are broadcasted over the flight deck speakers and through the headsets for the flight crew’s awareness during the landing.

- 1.1.9 Between 21:31:32 and 21:31:35 hrs, whilst the RWC was not aware that the flight crew of Aircraft A had not made out the earlier go-around instruction, the RWC noticed that Aircraft A was in a slight nose-up attitude, which, according to the RWC, looked similar to a go-around profile. When the RWC heard the transmission from the flight crew of Aircraft A, the RWC thought that they were asking for the go-around details. So, at 21:31:37 hrs, the RWC replied to the flight crew of Aircraft A with “Affirm climb two thousand feet, continue runway heading” and ended the communication with “going around confirm?”. The RWC had meant to seek confirmation from the flight crew of Aircraft A that they were indeed going around.
- 1.1.10 At this moment, Aircraft A was about 20ft above the ground and 500m past the runway threshold. Aircraft A did not go around but touched down on Runway 02L one second later at 21:31:38 hrs.
- 1.1.11 When Aircraft A touched down on Runway 02L, Aircraft B was about to exit RET W5 to enter the adjoining taxiway, and hence yet to vacate the runway strip (see **Figure 2**).



(Source: ANS) (Annotation: TSIB)

Figure 2 - Relative positions of Aircraft A and B when Aircraft A touched down

- 1.1.12 At 21:31:46 hrs, just as Aircraft B exited RET W5, the alarm message and audio alarm from the ASMGCS were cleared. At this point, the two aircraft were about 1,100m apart (see **Figure 3**).



(Source: ANS) (Annotation: TSIB)

Figure 3 - Relative positions of Aircraft A and B when Aircraft B exited the runway strip

1.1.13 Subsequently, Aircraft A vacated Runway 02L via RET W4 and taxied to its assigned parking bay without further incident.

1.2 Injuries to persons

1.2.1 There was no injury to any person.

1.3 Damage to aircraft

1.3.1 There was no damage to any aircraft.

1.4 Personnel information (Aircraft A)

1.4.1 Pilot-in-command (PM)

Age	59
Licence type	Commercial Pilot Licence
Issuing authority	Civil Aviation Administration of China
Licence validity date	Valid till 24 November 2029
Medical certificate	Class 1
Medical certificate validity	Valid till 22 October 2025
Medical operational proviso	Must wear corrective lenses for near vision
Last Base Check date	20 November 2024
Last Line Check date	19 December 2024
Total flying hours	20,798 hrs 20 mins
Aircraft types flown	AN24, FK100, A320, A340, B777
Total hours on type	7,685 hrs 10 mins
Flying in last 90 days	238 hrs
Flying in last 7 days	23 hrs
Flying in last 24 hours	0 hrs
Duty time in last 48 hours	0 hrs
Rest period in last 48 hours	48 hrs

1.4.2 Captain (PF)

Age	39
Licence type	Commercial Pilot Licence
Issuing authority	Civil Aviation Administration of China

Licence validity date	Valid till 22 July 2029
Medical certificate	Class 1
Medical certificate validity	Valid till 1 January 2026
Medical operational proviso	NA
Last Base Check date	24 April 2025
Last Line Check date	1 March 2025
Total flying hours	12,437 hrs 3 mins
Aircraft types flown	B737, B777
Total hours on type	7,035 hrs 16 mins
Flying in last 90 days	151 hrs 19 mins
Flying in last 7 days	9 hrs 56 mins
Flying in last 24 hours	0 hrs
Duty time in last 48 hours	0 hrs
Rest period in last 48 hours	48 hrs

#### 1.4.3 Second Officer (Communicator)

Age	28
Licence type	Commercial Pilot Licence
Issuing authority	Civil Aviation Administration of China
Licence validity date	Valid till 9 April 2030
Medical certificate	Class 1
Medical certificate validity	Valid till 27 July 2025
Medical operational proviso	NA
Last Base Check date	NA
Last Line Check date	19 March 2025
Total flying hours	1,211 hrs 1 min
Aircraft types flown	B737, B777
Total hours on type	620 hrs 42 mins
Flying in last 90 days	226 hrs 55 mins
Flying in last 7 days	24 hrs 17 mins
Flying in last 24 hours	0 hrs
Duty time in last 48 hours	13 hrs 40 mins
Rest period in last 48 hours	34 hrs 20 mins

#### 1.4.4 First Officer (Observer)

Age	33
Licence type	Commercial Pilot Licence
Issuing authority	Civil Aviation Administration of China

Licence validity date	Valid till 22 November 2029
Medical certificate	Class 1
Medical certificate validity	Valid till 13 October 2025
Medical operational proviso	NA
Last Base Check date	15 April 2025
Last Line Check date	NA
Total flying hours	6942 hrs 29 mins
Aircraft types flown	A320, B777
Total hours on type	5639 hrs 13 mins
Flying in last 90 days	190 hrs
Flying in last 7 days	28 hrs
Flying in last 24 hours	0 hrs
Duty time in last 48 hours	0 hrs
Rest period in last 48 hours	48 hrs

#### 1.4.5 Runway Controller

Age	35
ATC licence validity	Valid till 29 February 2028
Ratings	Changi Tower, Seletar Tower
Total experience	7 years 10 months
Experience in position manned	7 years 10 months
Duty time in last 48 hours	15 hrs
Rest period in last 48 hours	33 hrs

#### 1.5 Aircraft information

##### 1.5.1 Very High Frequency (VHF) Communication System on Aircraft A

1.5.1.1 Aircraft A was equipped with three independent VHF communication systems for voice communication between the flight crew and ATC, or between one aircraft and another.

1.5.1.2 When a VHF transmission is received by the aircraft, and with the appropriate radio channel selected for audio, the transmission will be broadcasted on any headset that is plugged into the system. During the landing, Aircraft A's flight crew were wearing their headsets for communication.

- 1.6 Meteorological information
  - 1.6.1 The occurrence took place at night. There was no precipitation and the visibility was 10 km.
- 1.7 Communications
  - 1.7.1 There was no reported defect with the VHF equipment utilised by ATC to communicate with the aircraft and other traffic on the day of the occurrence.
  - 1.7.2 There was no reported defect with the VHF systems on board Aircraft A.
- 1.8 Aerodrome information
  - 1.8.1 Runway strip
    - 1.8.1.1 The dimension of Runway 1 is 4,000m by 60m. The dimension of the runway strip is 4,240m by 280m. The runway and its exit taxiways (e.g. RET W5) are within the runway strip boundary (see **Figure 1**).
  - 1.8.2 Advanced Surface Movement Guidance and Control System (ASMGCS)
    - 1.8.2.1 The main functions of the ASMGCS are to provide identification and surveillance of aircraft and vehicles within the aerodrome, to control airfield ground lighting and to provide safety alerts. The ASMGCS also augments the air traffic controllers' visual observations of air traffic when visibility is not good.
    - 1.8.2.2 The RWC control position has an ASMGCS terminal which comprises a control screen, a speaker, a keyboard and a mouse. The ASMGCS presents traffic information on the control screen and can generate audio and visual alerts.
    - 1.8.2.3 The ASMGCS can automatically alert air traffic controllers of potentially dangerous situations and violation of traffic rules. These alerts can be classified as:
      - (a) Warnings – To identify conditions that are not serious but have the potential to cause an incident if they are not addressed.
      - (b) Alarms – To identify conditions that can cause a serious and potentially dangerous incident and that need immediate attention.
    - 1.8.2.4 Warnings are displayed on the control screen and are not accompanied by

an audio alert. Alarms are displayed on the control screen and are accompanied by an audio alert in the form of a recorded audio message, which will be played on the ASMGCS speakers. The audio alert is programmed to sound repeatedly until the runway incursion situation is resolved (i.e. when aircraft are sufficiently separated).

1.8.2.5 The investigation team reviewed the ASMGCS recordings for the occurrence flight as well as for some of the flights prior to the occurrence flight within the shift of the RWC. The investigation team noticed that there were a number of instances of warning and alarm messages being triggered momentarily when the preceding aircraft was still vacating the runway strip while another aircraft was on final approach. These alerts would typically disappear by the time the preceding aircraft had vacated the runway strip and before the following aircraft landed. The investigation team understands that the ASMGCS alerts frequently come on during peak hours.

1.9 Flight recorders

1.9.1 The flight recorders of Aircraft A were not obtained by the Transport Safety Investigation Bureau of Singapore (TSIB) as the aircraft had departed Singapore.

1.10 Medical and pathological information

1.10.1 Medical and toxicological examinations of the flight crew and RWC were not conducted.

1.11 Organisational and management information

1.11.1 Implementation of ICAO revised minimal aircraft separation criteria

1.11.1.1 The International Civil Aviation Organization (ICAO) groups aircraft into various wake categories, viz. Category A to G in descending order of wake turbulence generation potential (which depends on the wake generation and resistance characteristics of the aircraft, the maximum certificated take-off mass, wing characteristics and aircraft speeds). ICAO minimum aircraft separation criteria specify the minimum separation distance between any pair of successive aircraft approaching to land as a function of their wake categories. ICAO has in November 2020 revised the wake turbulence categorisation for aircraft and the minimum aircraft separation criteria following a safety study on wake turbulence. The revision was intended to

improve landing traffic throughput at airports. This revision entails a reduction of minimum separation distances.

- 1.11.1.2 In respect of Aircraft A and Aircraft B, the minimum separation between them had been reduced from 4nm to 3nm after the re-categorisation. The actual separation between Aircraft A and Aircraft B during their approach was about 3.5nm. This separation had met the latest ICAO aircraft minimum separation criteria.
- 1.11.1.3 After ICAO had revised the wake turbulence categorisation, the air traffic services provider (ATSP) conducted in March 2022 a risk assessment to identify possible hazards arising from implementing this re-categorisation. The result of the risk assessment was captured in a report known as the Safety Change Assessment Report (SCAR). While the SCAR strived to identify certain types of hazards during landing approach, it did not consider the hazard of the flight crew not responding to a go-around instruction and the aircraft lands on a runway before the preceding aircraft has vacated the runway strip (e.g. when the preceding aircraft was slow to vacate the runway strip).
- 1.11.1.4 The ATSP uses a metric known as the runway occupancy time (ROT) to monitor the performance of landing traffic throughput. The ROT is defined as the duration an aircraft spends on the runway after landing till it vacates the runway strip. According to the ATSP, the ROT increased during the period 2019-2024. The ATSP discussed the ROT trend at its bimonthly safety meetings with the various airlines operating in Singapore and encourages the airlines to remind their flight crews of the need to vacate the runway strip expeditiously and to inform ATC immediately if they encounter any delays in vacating the runway strip.

## 2 ANALYSIS

The investigation team looked into the following:

- (a) Communication between the RWC and the flight crew of Aircraft A
- (b) ATSP's risk assessment for the implementation of ICAO minimal aircraft separation criteria
- (c) The frequent incidences of ASMGCS alerts

### 2.1 Communication between the RWC and the flight crew of Aircraft A

2.1.1 The RWC had noticed that Aircraft B was slow in vacating the runway strip and instructed Aircraft A to go around (see paragraph 1.1.7). The RWC's go-around instruction, i.e. "China Eastern Five Four Five due runway occupied, go around, I say again go around, ...", identified clearly Aircraft A and conveyed clearly the need to go around.

2.1.2 As mentioned in paragraph 1.1.8, according to the flight crew of Aircraft A, they could not make out what and to whom the RWC was calling because there were radio altimeter callouts in the cockpit at that time.

2.1.3 Having instructed Aircraft A to go around, the RWC monitored Aircraft A to see if it was executing the go-around instruction. The RWC noticed Aircraft A was in a nose-up attitude, similar to one in a go-around profile. The RWC thought that Aircraft A was initiating a go-around. After the RWC's ended the first transmission, the flight crew of Aircraft A sought confirmation from the RWC three seconds later, enquiring with "Calling China Eastern Five Four Five?" to ask whether the RWC had contacted them. At this time, the RWC thought that they were seeking the go-around details.

2.1.4 The RWC responded with "Affirm climb two thousand feet, continue runway heading" and ended the communication with a question "going around confirm?" instead of repeating the full go-around instruction with the emphasis on the need to go around, as was the case when the RWC first instructed the flight crew of the Aircraft A to go around (see paragraph 1.1.7). Unlike the first go-around instruction issued by the RWC, the RWC's second communication did not convey the need or the urgency to execute the go-around. If the RWC had re-issued the same go-around instruction as what was communicated previously, this might have made the flight crew of Aircraft A realise that the RWC's earlier communication was a go-around instruction.

2.1.5 While the flight crew of Aircraft A had not made out the RWC's first communication (see paragraph 1.1.8) and had confirmed with the RWC again, the investigation team was unable to determine why the flight crew of Aircraft A did not recognise the RWC's second communication as a go-around instruction prior to landing.

## 2.2 The ATSP's risk assessment

2.2.1 The ICAO revised minimal separation criteria would enable an airport to accommodate, in theory, more aircraft landings and thus achieve higher landing traffic volume. But whether an airport can realise this benefit depends also on other factors, e.g. ROT of aircraft that had landed, aircraft landing speed, aircraft braking performance, runway surface conditions, unexpected runway delays, time needed for the preceding aircraft to vacate the runway strip (i.e. length of runway to traverse from the touchdown point to the nearest RET). Such factors should prompt ATSP to increase or decrease aircraft separation as needed.

2.2.2 When the ROT of the preceding aircraft increases (e.g. due to unanticipated delays or changes in the ongoing operational situation), the risk of a runway incursion with the aircraft on landing approach increases, particularly when operating at or close to the minimal aircraft separation criteria. The ATSP would need to strike a balance in managing efficient landing operations while maintaining safe aircraft separation.

2.2.3 Despite the actual separation between Aircraft A and Aircraft B being more than the ICAO minimal aircraft separation criteria (i.e. 3.5nm actual separation vs 3nm ICAO minimum criteria), the situation had still developed into a runway incursion. This serves as a reminder that, even when the aircraft separation complies with the ICAO minimal aircraft separation criteria, an air traffic situation is dynamic and it can change suddenly to reduce existing safety margins.

2.2.4 According to the ATSP's current risk assessment, during peak period of air traffic, the landing clearance could be given to an approaching aircraft before the preceding aircraft has vacated the runway strip with the air traffic controller issuing a go-around instruction if aircraft separation is assessed to be insufficient. However, the ATSP would also need to consider, in its risk assessment, the factors that could erode safe aircraft separation and the possibility that go-around instructions may not be heard or complied with by the flight crew (e.g. communication breakdown between the RWC and the flight crew, or in the event of communication equipment failure),

thus resulting in an aircraft landing on the runway before the preceding aircraft has vacated the runway strip.

2.2.5 To prevent recurrence, it would be desirable for the ATSP to review their risk assessment, to identify the necessary control measures to mitigate such runway incursion risk.

2.2.6 The revision to ICAO minimal aircraft separation criteria demands aviation stakeholders to strike a balance between managing air traffic efficiently and maintaining safe operations. Though the revised criteria may allow certain categories of aircraft to have reduced separation, aviation stakeholders should proactively and continually assess whether their current operational environment can cater for such minimal aircraft separation. An ever-changing aviation environment would require stakeholders to constantly review and, where applicable, refresh existing safety assessments to identify new hazards that often lay hidden at the confluence of several complex systems (such as air traffic management, airport design, flight operations, human factors). By correctly identifying the potential risks, aviation stakeholders can gain a better understanding of operational limitations to allow for necessary improvements to be made or for robust control measures to be implemented to ensure continued safety.

2.3 Frequent incidences of the ASMGCS alerts

2.3.1 As described in paragraph 1.8.2.5, the investigation team noticed that ASMGCS 'runway incursion' alerts were activated for several of the flights prior to the occurrence flight.

2.3.2 In this occurrence, the RWC had issued the landing clearance to Aircraft A before any ASMGCS warning and alarm messages had displayed on the ASMGCS screen. After the ASMGCS alarm message and audio alert came on, the RWC's attention was on making an assessment of the traffic situation between Aircraft A and Aircraft B. While the ASMGCS alert was still on, the RWC initially assessed that Aircraft B (which was still taxiing along RET W5) would be able to vacate the runway strip before Aircraft A touches down. It was only when Aircraft B made a momentary pause to seek confirmation on the taxi route from the RWC, which delayed its exit from the runway strip, that the RWC re-assessed that a runway incursion situation was likely and issued a go-around instruction to Aircraft A.

2.3.3 The ASMGCS alerts were designed to serve as a safeguard to warn air traffic controllers of a serious and potentially dangerous situation that may

require immediate assessment or intervention. The ASMGCS alert thresholds are programmed based on the relative positions, speed differences and actual speeds of two targets (e.g. between two aircraft, or between aircraft and ground vehicle), the key considerations being the rate at which these two targets are approaching each other and whether a collision is imminent. According to the ATSP, the current alert thresholds of the ASMGCS warnings and alarms functioned as designed and the RWC had responded promptly and appropriately when the alarms were activated. The investigation team opines that the frequent triggering of the ASMGCS alerts during periods of peak airport landing traffic could be either an indication that the actual aircraft separations are close enough to the threshold of runway incursions or the ASMGCS alert thresholds are too sensitive and need to be programmed or adjusted to prevent the frequent activations.

- 2.3.4 The investigation team is concerned that the frequent incidences of ASMGCS alerts during peak periods of air traffic could desensitise the air traffic controllers over time due to stimuli overexposure. While this was not the case in respect of the RWC involved in this occurrence, such stimuli overexposure or ‘alarm fatigue’ could reduce responsiveness or cause individuals to start treating such alerts as non-actionable or even spurious. This is especially so when, for the majority of such alerts, the conflicting aircraft typically vacates the runway strip before the situation escalates into a runway incursion and does not result in any intervention by a runway controller (i.e. go-around instruction issued).

### 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 The runway incursion occurred when an aircraft (Aircraft A) landed on the runway, despite being instructed to go around, while the preceding aircraft (Aircraft B) had yet to vacate the runway strip.
- 3.2 At an earlier juncture, the ASMGCS had detected an impending runway incursion situation between Aircraft A and Aircraft B. Aircraft B pausing momentarily during its taxi along RET W5 to re-confirm its taxi route had exacerbated the likelihood of the runway incursion situation.
- 3.3 The RWC, assessing that Aircraft B would unlikely be clear from the runway strip by the time Aircraft A had touched down, issued a go-around instruction to Aircraft A. However, the flight crew of Aircraft A could not make out the RWC's communication, possibly due to simultaneous radio altitude callouts in the cockpit.
- 3.4 The RWC was unaware that the flight crew of Aircraft A had not made out the RWC's go-around instruction. The RWC had observed Aircraft A was in a slight nose-up attitude, similar to one in a go-around profile, and thought that Aircraft A was in the process of performing the go-around.
- 3.5 When the flight crew of Aircraft A contacted the RWC to query if the RWC was contacting them, the RWC thought that the flight crew was asking for the go-around details and replied with the altitude and heading details and a follow-up question to check if they were going around. Unlike the first go-around instruction, the RWC's second communication did not convey the same urgency to the flight crew of Aircraft A to perform the go-around. The investigation team was unable to determine why the flight crew of Aircraft A did not recognise the RWC's second communication as a go-around instruction prior to landing.
- 3.6 The risk assessment by the ATSP, with regard to the implementation of ICAO minimal aircraft separation criteria, had not taken into account the possibility of hazards relating to go-around instructions not being heard or complied with by the flight crew of the landing aircraft.
- 3.7 The frequent incidences of ASMGCS alerts, observed during prior consecutive aircraft landings before this occurrence, would indicate that the aircraft separation was likely close enough to the threshold of runway

incursions or the ASMGCS alert thresholds are too sensitive. This situation results in less reaction time for air traffic controllers to manage certain situations like go-around instruction not heard or complied with by the flight crew or when the preceding aircraft takes too long to vacate the runway strip.

- 3.8 The frequent ASMGCS alerts could pose a risk of desensitising the runway controllers such that these warnings lose their significance due to stimuli overexposure.

## 4 SAFETY ACTIONS

*Arising from discussions with the investigation team, the organisations have taken the following safety action.*

4.1 The ATSP has taken the following actions:

- a) On 23 May 2025, the ATSP engaged the operator of Aircraft A to review the circumstances of the occurrence and to emphasise the importance of adhering to ATC instructions.
- b) Following this occurrence, briefings to all aerodrome-rated air traffic controllers were conducted as an immediate safety reinforcement measure. These briefings covered the sequence and factual circumstances of the occurrence, together with general operational reminders, to raise awareness among air traffic controllers of the potential for flight crews not to respond as expected to ATC instructions and to reinforce the importance of vigilance during runway operations.
- c) The ATSP has conducted a Qualitative Safety Assessment on 25 May 2026 covering the possibility of flight crews not responding to the air traffic controller's go-around instruction. This risk assessment considered potential operational, human and communication factors contributing to this particular hazard, and reviewed the existing control measures. Following this risk assessment, the ATSP will add further briefings and training to reinforce air traffic controller awareness in managing this hazard.
- d) With regard to the constant ASMGCS alerts, the ATSP has initiated a study of the current ASMGCS alerting system, the study is scheduled to be completed by September 2026. The ATSP aims to use this study to identify possible improvement areas in the ASMGCS while ensuring that any new implementation does not compromise the ASMGCS's ability to provide critical alerts to the air traffic controllers in the event of an actual runway incursion.

4.2 The operator of Aircraft A has taken the following actions:

- a) On 22 May 2025, the operator briefed all its pilots on the safety lessons of this occurrence with emphasis on risk management and safety awareness during the go-around procedures.
- b) On 22 May 2025, the operator developed training materials on similar communication-related safety incidents for pilot training. In addition, on

23 May 2025, the operator launched a special initiative in the form of seminars focused on improving the English language communication skills of their pilots.

- c) On 25 May 2025, the operator issued a technical advisory concerning the prevention of runway incursion, reminding its pilots to be vigilant to ATC's instructions during approach, landing and ground operations.
- d) On 27 May 2025, the operator issued an operational risk advisory reminding pilots that they may be instructed to go around at any altitude and to execute the go-around immediately upon receiving such instructions.

## 5 SAFETY RECOMMENDATIONS

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