



Australian Government

Australian Transport Safety Bureau

Interrupted engine start and evacuation involving SAAB 340B, VH-ZRK

Melbourne Airport, Victoria, on 5 April 2022

ATSB Transport Safety Report

Aviation Occurrence Investigation (Defined)

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Addendum

Page	Change	Date

Interim report

This interim report details factual information established in the investigation's early evidence collection phase, and has been prepared to provide timely information to the industry and public. The report contains 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 5 April 2022, a Regional Express SAAB 340B aircraft, registered VH-ZRK, was being prepared for an air transport flight from Melbourne, Victoria to King Island, Tasmania. The scheduled departure time was 1445 local time.

The crew consisted of a captain, first officer, and one flight attendant, and there were 23 passengers. Following door closure, the flight attendant commenced the passenger safety briefing using the public address (PA) system.

As was the normal procedure, a marshaller (ground staff member) was positioned at the front of the aircraft to monitor the engine start. The flight crew completed the engine start checklist and started the right engine.

Preliminary review of the closed-circuit television (CCTV), on-board recordings, and interviews with the crew indicated the following sequence of events after the right engine was started:

- A second ground staff member went to the rear right side of the aircraft in preparation to disconnect the ground power unit (GPU).¹
- The captain began to start the left engine.
- During the left engine start process, the second ground staff member disconnected the GPU from the aircraft (prior to receiving the signal from the flight crew to do so).
- The captain initiated the interrupted engine start procedure for the left engine, which included motoring² to remove any residual fuel from inside the engine.
- As the left engine propeller began to rotate, flame and smoke were visible coming from the rear of the left engine. The initial flames were visible on the CCTV for about 3 seconds.
- The marshaller, who was still positioned at the front of the aircraft, noticed the flames and began to signal to the flight crew to stop the engine start using the appropriate hand signal. However, the marshaller could not recall the hand signal for fire³ and instead communicated to the flight crew by mouthing the words 'smoke' and 'flame' and gesturing to the left engine.
- The captain ceased motoring the left engine and the left propeller stopped.
- At about this time, the flight crew noted that the left engine interstage turbine temperature (ITT)⁴ was still rising and in response the captain decided to make a second attempt at motoring.
- The marshaller continued to signal to the flight crew that there was a problem, which prompted the captain to check outside their window. The captain could not see any flame or fire. (Note: only the front of the engine is visible from the flight deck).
- There was no indication in the flight deck that there was a fire in the left engine or an overtemperature of the tail pipe; that is, there was no master warning, no relevant indications on the caution and warning panel, no audible chimes and the fire handles were not illuminated.

¹ Ground power unit: an external generator that provides power to the aircraft.

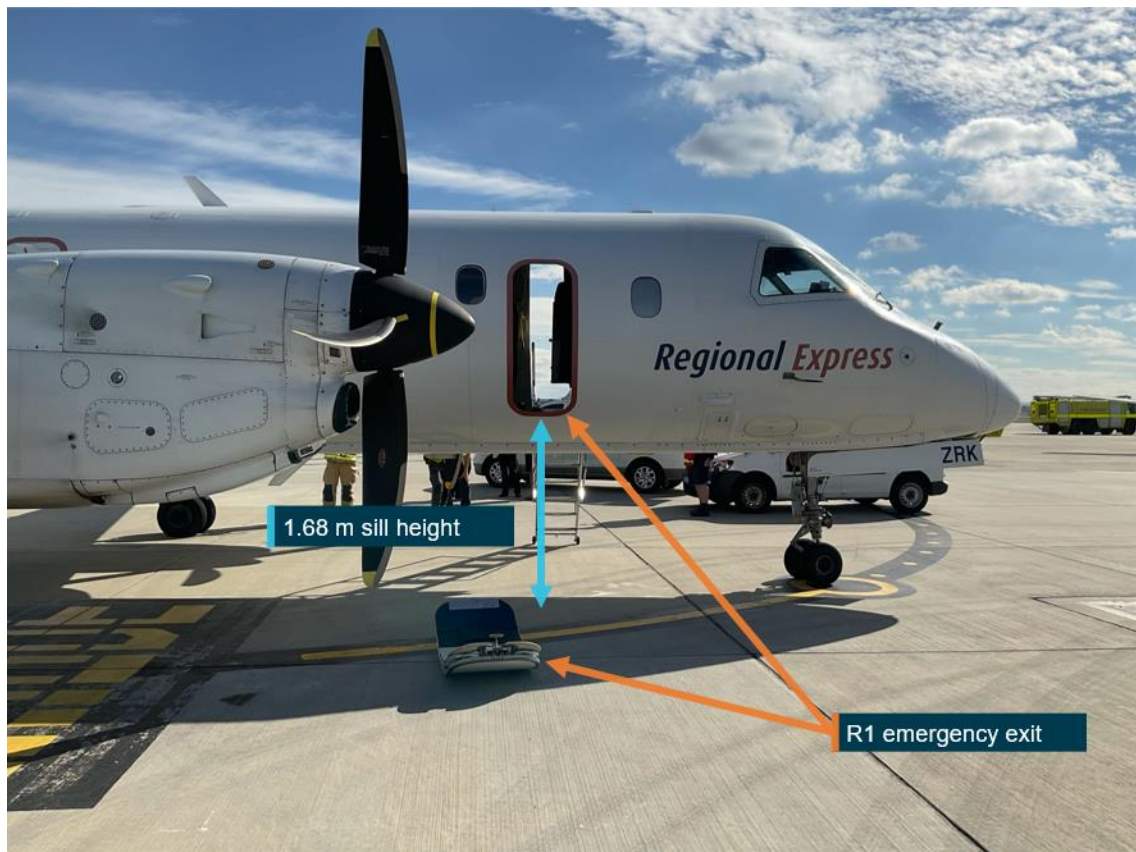
² Motoring: rotating an engine (usually gas turbine) by means of its starter for a purpose other than starting.

³ Ground signal for fire: move right hand in a 'fanning' motion from shoulder to knee, while at the same time pointing with left hand to area of fire.

⁴ Interstage turbine temperature: the temperature of the gases between the high-pressure and the low-pressure turbines.

- The captain later reported that, given the signals from the marshaller and the rising ITT, they decided to action the engine fire emergency checklist and evacuate the aircraft. Accordingly, the flight crew pulled the fire handle for the left engine.
- After the first fire extinguisher bottle had been discharged, additional flame and smoke could be seen coming from the left engine tail pipe.
- The captain cycled the seat-belt sign twice (which created 4 chimes) to notify the flight attendant to evacuate.
- About 30 seconds after the first extinguisher bottle had been discharged, the flight crew discharged the second bottle.
- The captain opened the flight deck door and commanded the flight attendant to commence an evacuation, specifying the use of the forward right (R1) exit only. The captain then attempted to make a PA to the passengers.
- After the right propeller stopped rotating, the R1 exit was opened. Shortly after, the first passenger exited the aircraft. The evacuation of all passengers and crew via the R1 door (Figure 1) took about 4 minutes.
- Two passengers received minor injuries during the evacuation.
- Subsequent examination of the aircraft and engine revealed no damage.

Figure 1: Forward right (R1) emergency exit



The R1 door has no escape slide. Passengers are instructed to 'sit and jump' from the door sill.
 Source: Melbourne Airport, annotated by the ATSB

Safety action

Following the occurrence, Regional Express took the following safety action:

- A new hand signal was developed to indicate an interrupted engine start and was included in face-to-face and computer-based training content.

- A training package and guidance was provided to ground staff about dispatch procedures and hand signals.
- Guidance highlighting the correct marshalling signals was issued to all flight crew.
- Posters detailing ground signals were placed in ground crew high traffic areas.
- Operational manuals for both the flight crew and ground crew in relation to hand signals were reviewed and updated.

Further investigation

The investigation is continuing and will include review and examination of:

- flight crew failure management procedures
- crew communication and coordination
- flight crew, flight attendant and ground staff recurrent training
- on-board recordings.

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.

A final report will be released at the conclusion of the investigation.

General details

Occurrence details

Date and time:	5 April 2022-1452 EST	
Occurrence class:	Serious incident	
Occurrence categories:	Fire, smoke, emergency evacuation	
Location:	Melbourne Airport, Victoria	
	Latitude: 37° 40.4' S	Longitude: 144° 50.6' E

Aircraft details

Manufacturer and model:	S.A.A.B Aircraft Company	
Registration:	VH-ZRK	
Operator:	Regional Express	
Serial number:	340B-397	
Type of operation:	Australian air transport operations – larger aeroplanes	
Activity:	Commercial air transport-Scheduled-Domestic	
Departure:	Melbourne, Victoria	
Destination:	King Island, Tasmania	
Persons on board:	Crew – 3	Passengers – 23
Injuries:	Crew – nil	Passengers – 2 minor
Aircraft damage:	None	