Accident

Aircraft Type and Registration:	Boeing 737-8AS, 9H-QAA
No & Type of Engines:	2 CFM-56 turbofan engines
Year of Manufacture:	2017 (Serial no: 44782)
Date & Time (UTC):	21 August 2024 at 0808 hrs
Location:	London Stansted Airport
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 6 Passengers - 181
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to tail cone, tail fuselage and APU
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	35 years
Commander's Flying Experience:	6,407 hours (of which 6,150 were on type) Last 90 days - 225 hours Last 28 days - 78 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

While being pushed back by a tug at London Stansted Airport, the aircraft's tail struck the blast fence at the end of the taxiway. This caused extensive damage to the rear of the aircraft, including its APU.

The airport operator has taken safety action by making the 'Tug release point' ground markings more prominent. The report discusses ways to prioritise tasks and maintain situation awareness, and the importance of ground crew being vigilant of each other, and being ready to act when things do not go as expected.

History of the flight

The aircraft was scheduled to operate from London Stansted Airport (Stansted) to Venice Marco Polo Airport, with a planned departure time of 0805 hrs. After the boarding was complete at Stansted, the crew requested a 'remote hold'[1] because of an ATC slot time of 0840 hrs. The aircraft was cleared by ATC for a long pushback "TO THE BOTTOM OF THE APRON [D]" from Stand 63R (Figure 1). This involved the aircraft being pushed back to the end of the cul-de-sac on Apron Delta, abeam Stand 61L, where the tug would be disconnected, without the aircraft's engines being started. The crew would then start the engines at an appropriate time to make the slot time.

Footnote

[1] Remote hold – departing from stand but waiting elsewhere on the airport for an ATC takeoff slot.

The pushback crew consisted of a headset operator and a wingman, who were on foot. A tug driving instructor (tug instructor) and trainee tug driver (trainee driver) were seated beside each other in the tug. The flight crew were in communication with the headset operator via the aircraft's interphone.

Figure 1

Location of relevant stands at London Stansted Airport (UK AIP)

The pushback was commenced by the trainee driver. The initial turn onto the taxiway centreline was started too early so, with some instruction from the tug instructor, the trainee driver made several corrective turns. Noticing this, the aircraft commander asked the headset operator what was happening, who then explained that the driver was undergoing training.

The trainee driver decided to stop the pushback and asked the tug instructor to take over. After swapping seats the instructor recommenced the pushback, correcting the aircraft back onto the taxiway centreline. He continued to reassure and advise the trainee while performing the pushback, looking at her while doing so. The headset operator continued walking on the right side of the tug, abeam its cabin. The wingman was on the left just ahead of the tug.

The aircraft's nosewheel reached the 'Tug release point'[2] (TRP) ground markings (Figure 4), such that the tug was meant to stop. However, it continued moving beyond the TRP with its engine at idle and hit the blast barrier at the end of the cul-de-sac (Figure 2). Realising what had happened, the tug instructor pulled the aircraft forward off the fence then stopped the tug.

The airport operator and ATC were notified. Soon after, representatives from the airport operator and the RFFS were on scene. The aircraft sustained substantial damage to the rear of the aircraft, including the APU, which was running at the time (Figure 3).

Footnote

[2] See *London Stansted Airport information* section below for more information on TRP.

Figure 2

Images of the collision with the blast fence from CCTV

Following the accident the tug instructor's employer conducted a breath test for drugs and alcohol on the instructor. This was negative for drugs and was below a relevant alcohol limit for persons performing ground roles.

Figure 3

Rear of the aircraft showing the damage sustained

Airport information

TRPs were introduced at Stansted in 2020. A TRP consisted of a 0.5 m red line, painted on one side of the taxiway line (Figure 4). They are used for Code C[3] aircraft or smaller[4]. The TRP on Taxiway Delta is between Stands 61L and 61R. There is a 14.97 m clearance behind a B737-800 and the blast fence when its nosewheel is on the TRP.

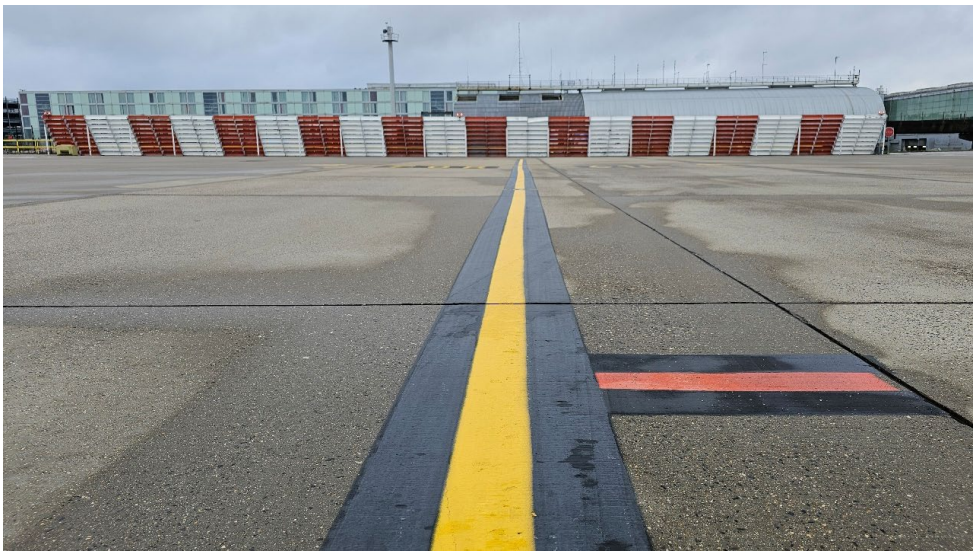

Figure 4

Image of the TRP and blast fence around the time of the accident

Since this accident the airport operator has increased the length of TRPs from 0.5 m to 1 m and painted it on both sides of the taxiway centre line (Figure 5).

Figure 5

Upgraded TRP since the accident

Footnote

[3] Code C – aircraft with a wingspan of up to 36 m.
[4] The Boeing 737-800 aircraft has a wingspan of 34 m.

Ground crew information

Tug driving instructor

The tug instructor was also a qualified headset operator and wingman. He reported that he had driven past the TRP while he was focussing on speaking to the trainee. He added that the TRP was not very prominent and obscured underneath the aircraft's fuselage. He said that because the aircraft's engines had not been started, there was no thrust opposing the tug's idle engine power during the later part of the pushback. While aircraft engines are more commonly started during pushback, it is not unusual (as in this case) for crew to delay starting them until after the tug has disconnected.

The tug instructor stated that the method for getting a tug driver to stop quickly was to raise a clenched first, indicating the driver should apply the tug's brakes. However, he suggested such a visual signal was not sufficient given a driver would be concentrating on the pushback, with the headset operator often out of his field of view. He did not receive any warning of the impending collision from the wingman or the headset operator.

He stated that, after the aircraft struck the fence, he pulled it forward again instinctively. With hindsight, he believed leaving it in situ and gaining advice would have been preferrable.

Trainee tug driver

The trainee driver was qualified as a headset operator and wingman, and was aware of the TRP through the training for these roles. This was her second pushback. The first was completed earlier that day, without event.

The trainee driver reported that she felt the tug slow down as the aircraft's nose wheel approached the TRP, so believed the instructor would stop the pushback. However, she did not say anything when he drove past the TRP, assuming he must have known what he was doing. After the collision, she suggested not moving the aircraft off the blast fence.

Headset operator

The headset operator was also qualified as a wingman. Prior to this accident, he knew about TRPs from his training for the headset operator role but had not physically seen one.

He commented that the tug instructor took over when the aircraft was abeam Stand 62 and thereafter was attending to talking to the trainee. The tug slowed down when the aircraft was abeam Stand 61, so he positioned himself to disconnect the tug from the aircraft when it stopped. However, the aircraft continued to move slowly until it hit the blast fence. He said he assumed the instructor had a reason for that and did not question his actions.

Wingman

The wingman was also a qualified headset operator. On the day of the accident, he had been called into work at short notice. To avoid delaying the pushback, he had not collected the marshalling wands from the tug. Nevertheless, it was not mandatory to use them. He commented that the TRP was quite small.

Towards the end of the pushback, the tug appeared to slow down. As he normally would at that stage, he stopped walking in preparation for retrieving the aircraft chocks after disconnection of the tow bar. He noticed the aircraft's main wheels pass the line which indicated Stand 61L and realised it had gone passed the TRP. He wondered if the instructor was showing the trainee how far an aircraft could go beyond the TRP. By the time he looked at the headset operator to see if he knew what was happening, the aircraft hit the blast fence.

Ground handling agent's comments

A representative of the ground handling agency commented that all members of ground crew are taught how to stop a pushback[5] in their basic training. This is usually done with the headset operator verbally communicating this to the flight crew, or by hand signals – which relies on each member of ground crew having visual contact with one another. They added that all staff are encouraged, regardless of role or authority, to challenge and report anything they deem unsafe. To avoid being distracted, staff are trained '*to focus on the job in hand*'. A '*Just Culture'* is actively promoted.

Since this accident the ground handling agency has issued a reminder to all staff about TRP procedures. This has been incorporated into training modules for each role.

Aircraft marshalling signals

As well as the clenched fist signal for stopping a tug, the universal signal to stop an aircraft is for a ground crewmember to abruptly extend their arms and/or wands to the top of their head, crossing wands (Figure 6).

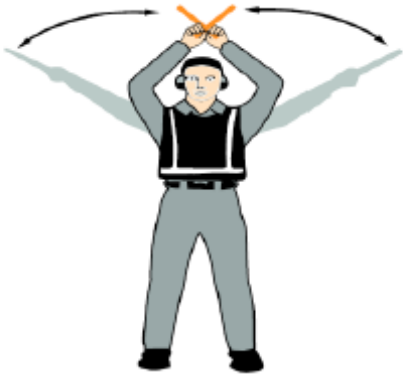

Figure 6

The signal to stop an aircraft in an emergency

Human performance

Situation awareness

A commonly used task prioritisation and situation awareness[6] tool in aviation is *'Aviate, navigate, communicate'* (ANC).

Footnote

[5] See *Aircraft marshalling signals* section below.

[6] Situation awareness (SA) – understanding the current and changing state of an operation. Increased SA increases a person's ability to anticipate variations or developments.

Applied to a tug pushing an aircraft, 'Aviate' would involve prioritising the technical aspects of driving the tug. Thereafter, 'Navigate' would mean checking its trajectory. Finally, 'Communicate' could refer to training aspects.

Startle and surprise

Startle is a temporary, reflex-like response to sudden stimuli. A paper by EASA on *'Startle effect management'*[7] explained that it *'creates a sense of urgency to take action* [and] *perceived time pressure. This action-mode inhibits slow and deliberate analysis.'*

Surprise is an emotion which results from a difference between expectations and reality. It requires re-evaluation of the situation and usually lasts longer than the startle response.

Analysis

The tug instructor realised he had driven past the TRP while attending to speaking to the trainee driver. The difference in managing the energy of an aircraft which – perhaps slightly less commonly – did not have its engines started during the pushback might have led him to subconsciously expect the tug was stopping. This event highlights challenges related to performing a training role in a time-critical, dynamic environment. ANC can help with prioritising tasks and building situation awareness. Any time a pushback team member feels uncertainty, the tug should be stopped immediately so that situation awareness can be rebuilt individually, and as a team.

The wingman and headset operator appeared to experience a level of surprise when the tug instructor exceeded the TRP. By the time they had wondered about his reason for doing so – with one of them trying to get visual contact with the other – it was too late to signal that the tug instructor should stop. The instructor explained the difficulty in noticing hand signals while driving, with other team members being out of his line of sight. Accordingly, this event highlights the importance of team members being vigilant of each other and being ready to act when things do not go as expected.

In this case, the wingman did not use the marshalling wands. Although there was no requirement to used wands, they can offer more conspicuity than arms alone.

The instructor was probably startled by the collision and consequently took immediate action to correct the error by pulling the aircraft forward again. Resisting the urge to act while startled allows time for more deliberate thought processes to be regained.

The driving instructor and wingman suggested the TRP was not very prominent. The airport operator has increased the size of TRPs at the airport.

Footnote

[7] R:\SM1\1.1 SAR\1.1.2 RCO\6_PROJ_EASA\Research\2015\2015.C22 Startle Effect Management STEM\3-Deliverables\Final Report\research-project-cover-page [accessed 11 September 2025]

Conclusion

The aircraft was pushed beyond the TRP while the tug driving instructor was focussed on training another driver, while performing the driving task. It struck a blast fence at the end of a cul-de-sac.

The report discusses task prioritisation and situation awareness tools; and the importance of ground crew remaining vigilant of one another and being ready to act when things don't go as expected.

Safety actions

As a result of this incident the airport operator took the following safety action:

> The maximum nosewheel tug release points have all been increased in size from 0.5 m to 1 m and painted it either side of the taxiway centre line.

As a result of this incident the ground handling agent took the following safety action:

> A reminder has been issued to all staff about the tug release points, and that an aircraft's nosewheel should not go beyond it during pushback.