

ABDUCTIO Blinded Case Packet
Case: Boeing_737-8AS_9H-QAA_12-25

Purpose:

This packet is intentionally limited to historical/factual narrative content.

Excluded sections from the source report:

- Synopsis
- Analysis
- Conclusions
- Safety actions/recommendations

Source PDF:

/Users/davidjoseph/github/abductio-core/case_studies/data/UK_AAIB_Reports/Boeing_737-8AS_9H-QAA_12-25.pdf

HISTORY CONTENT (verbatim extract file used by the case-study pipeline)

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.

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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.

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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

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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 C3 aircraft or smaller⁴.

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.

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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 fist, 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 preferable.

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 t

hem. He commented that the TRP was quite small.

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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 pushback⁵ 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 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.

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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.