

Date	11 th October 2023	Incident Start Time	16:16
Log References	Compass Ref - 116811	Incident Category	Severe (Black)
Incident Type	Track Circuit Failure / 9W18 unable to transition to TPWS (EB)	Incident Resolve Time	17:46 (TCF)

Debrief Personnel	SSDO, STSM, DCM
Incident Summary (Facts)	<p>The Elizabeth line was subjected to severe delays owing to a track circuit failure (ECA/ECB) on the Down Electric line at Stratford (platform 8) causing signals L267 and L277 to remain at danger. Trains to be cautioned past.</p> <p>In addition 9W18 (012 unit) failed to transition from CBCT to TPWS having had an emergency brake application. The Driver experienced issues with coming out of CBTC to TPWS which was eventually resolved via the ISST support in recycling the MCS, new SOM and CBTC reset. This allows the train to move forward into Maryland before gaining normal line speed.</p> <p>S&T arrived on site and identified a burr across the IBJ which was cleaned seeing the track circuit failure clear. Normal running was given at 17:46 with a good service not achieved until 22:00.</p> <p>Crowd control measures were taken to control the flow of customers specifically at Stratford and Canary Wharf, with no reported customer issues or closures.</p> <p>Stranded trains were 2C20, 9W22, 9W24 and 9W28 all of which were resolved owing to a plan to work them forward into Stratford via platform no 5. As a consequence this not only hampered westbound services but added to congestion at Stratford and crowd management because of the change of platforms at an already busy interchange location in the PM peak EB direction of travel.</p> <p>Service recovery was protracted, along with dealing with the incident train and time to fix (details picked up below). A SPIR is being arranged to review and deep dive into the technical time line, review of process to diagnose and fix the train issue as well as review the response to the track circuit failure. This is to understand and action identified opportunities swiftly to enable an improved response for the future.</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
	<p>Immediate Root Cause:</p> <ul style="list-style-type: none"> - Track Circuit failure – contaminated IBJ which was cleaned. Underlying root cause and preventative measures to be further explored with NR Track/Signalling maintenance

team to understand regime for activities to detect early to prevent such failures.

- 9W18 (012 Unit) – Failed to transition into TPWS from CBTC owing to the suspected track circuit failure, was authorised to pass signal at danger however the Driver was unable to step into TPWS having had an emergency brake application and clear EB Banner without ISST intervention and support. Requires Fleet download to understand if any train borne issues contributed to the failure/resolution and if anything could have been done differently by the Driver or ISST to resolve much sooner.

Wheel Stop: 16:15

Wheel Start: 16:48 / 17:13

Total Duration: Track Circuit Failure 90 min / Resolve of 9W18 32 min (SFD) 56 min (MYL)

Stranded Trains (between stations and resolve duration):

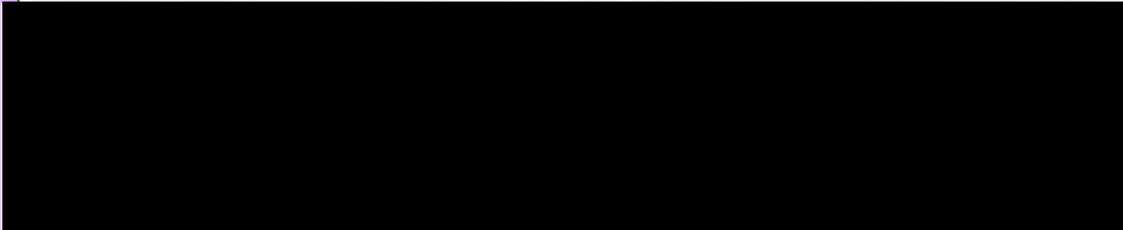
All Stranded trains were focused upon by the NR Signaller in agreement to be dealt with seeing all 4 trains worked around platform no 8 9W18 via platform no 5, seeing them dealt with within 33 minutes. However not ideal duration wise and owing to their heavy loading and impact to westbound services being held as a consequence, this was the correct decision whilst defect handling ensued for 9W18. There were no reported issues upon the stranded trains or Passenger alarms generated.

- 2C20 16:18 - 16:47 (Plt 5 SFD) 29 min
- 9W22 16:18 – 16:51 (Plt 5 SFD) 33 min
- 9W24 16:24 – 16:55 (Plt 5 SFD) 31 min
- 9W28 16:28 – 16:58 (Plt 5 SFD) 30 min

Contingency Plan (if applicable): GE02

EAST – GE02: Ilford to Stratford – Partial Block

Central Operating Section - Trains Per Hour Minimum



From the East

- Abbey Wood to Paddington (LL) services unaffected and run as booked.
- Abbey Wood to Reading services unaffected and run as booked.
- Abbey Wood to Maidenhead services unaffected and run as booked.
- Abbey Wood to Heathrow services unaffected and run as booked.
- Shenfield to Heathrow services unaffected and run as booked.
- Service reduced to 4TPH between Shenfield and Paddington (LL). (9 Units Required)
- Gidea Park to Liverpool Street HL withdrawn (Peak Only).

From the West

- Paddington (LL) to Abbey Wood services unaffected and run as booked.
- Reading to Abbey Wood services unaffected and run as booked.
- Maidenhead to Abbey Wood services unaffected and run as booked.
- Heathrow to Abbey Wood services unaffected and run as booked.
- Heathrow to Shenfield services unaffected and run as booked.
- Service reduced to 4TPH between Paddington (LL) and Shenfield. (9 Units Required)
- Liverpool Street HL to Gidea Park withdrawn (Peak Only).

Customer Messaging



- Minor delays off peak/severe delays peak between Stratford - Shenfield.

Unit Considerations



- Old Oak Common/Maidenhead/Plumstead – Available
- Gidea Park/Ilford/Shenfield – Available

Additional Considerations



- Control to consider turning additional services short of destination in conjunction with the above contingency plan to support other areas if applicable.

1 of 1

Indicative Customer Delay (min): 57 min

Customer Experience (Impact/Comms/Service Status):

- 16:30 – Minor delays Whitechapel to Shenfield
- 16:33 – Ticket acceptance with GA, DLR, LU and shortly with London Buses (LIS-BRD)
- 16:38 – Severe delays Whitechapel to Shenfield
- 17:25 – Severe delays Paddington to Abbey Wood / Shenfield
- 17:56 – Severe delays whole line
- 18:47 – Minor delays Paddington to Reading/Heathrow
- 18:47 – Severe delays Paddington to Abbey Wood / Shenfield
- 18:58 – Severe whole line
- 19:23 – Minor delays Paddington to Abbey Wood
- 19:23 – Severe delays Whitechapel to Shenfield / Paddington to Heathrow / Reading
- 20:49 – Minor delays Reading / Heathrow to Abbey Wood
- 20:49 – Severe delays Whitechapel to Shenfield
- 21:05 – Minor delays whole line
- 22:00 – Good service whole line

Ticket Acceptance:

- *London Underground via any reasonable route*
- *London Buses via any reasonable route*
- *Greater Anglia between Liverpool Street and Shenfield*
- *DLR via any reasonable route*
- *Southeastern between Abbey Wood and London Terminals*
- *Thameslink between Abbey Wood and Farringdon*
- *GWR between Paddington and Reading*
- *SWR between Waterloo and Reading*

Indicative PPM: 180

Timeline (Facts)

Timeline (summary):

16:15 - TRC East has advised that there is a track circuit failure on the down electric at Stratford. 9W18 is the first service to go through the affected area. Delays expected eastbound. Services to be monitored and to be diverted to Abbey Wood if necessary.

16:26 - DCM Central diverts 9Y61 to OOC. 9W42, 9Y13 Cape.

16:35 - 9W46 diverted to Paddington higher level to form 5Y00. 9Y17, 9W14 Cape.

16:40 - Multiple amendments to take place.

16:47 - Steps ups taking place, Stranded trains 2C20 , 9W22, 9W24 and 9W28.

16:48 - Track circuit ECA and ECB have failed showing clear when occupied Sfd Platform 8

16:48 - 9W18 has stepped forward.

16:58 - No trapped trains as trains have used platform 5.

17:02 - GE02 contingency being considered.

17:04 - Driver risks being identified due to delays in the Down Electric direction

17:12 - 9W18 is now experiencing issues post transition at Maryland.

17:13 – 9W18 OTM at line speed (TPWS) (to be removed at GDP further investigation).

17:16 - Track circuit fault has cleared. 9W44 arrives and departs under clear signals.

17:24 - Track circuit failed again. S&T are on site and will granted access to inspect.

17:25 – 9W50 diverted eastbound via platform no 5

17:40 - 2 trains at LST HL will form 2W80 and 2W64 special services.

17:43 - S&T have confirmed that they have found a burr across the IBJ. Tracks have been cleaned and this has cleared the track circuit fault.

17:44 – 9W62 arrives and departs under clear signals via EB platform no 8.

18:00 - Service recovery taking place, DCMs implementing recovery plan.

18:49 - Secondary event in Southall PIOT hindering service recovery.

19:11 - Elizabeth Line are currently running with delays of up to 40 mins across the route.

20 – 40 mins late: 8 services
10 – 20 mins late: 5 services
5 – 10 mins late: 10 services
And seven missing circuits

19:13 - Due to ill passenger alterations are taking place on the West to achieve right time services.

19:45 - Driver displacement being manage. Unit displacement being managed to allow for stock balance.

20:20 - Delays on the service now reducing and DCMs working through recovery plan.

22:00 - Good service declared and unit displacement being checked by night shift.

Notifications / Time to Site of Key responders:

- S&T @ SFD 17:20 (60 minutes)

Train Service Management / Recovery:

Service recovery was protracted in nature owing to the challenges experienced by the Control team from initial diversions, cancelations and hold of the service in the peak, further contributed by no SDRMS on shift to support Driver resource management from the expected displacement of Drivers and no off the shelf process in situ to rebuild the service ex a contingency plan.

16:30 - 9W30 to divert to ABX

16:38 - 9W32 and 9W36 diverting to ABX

16:42 - 2C34 has left LST HL and will serve SRA P10 not call MYL and go back onto the Down Electric.

16:45 - 9W46 being diverted to PAD HL - Pad Base aware. Standby unit at PAD HL to be sent to OOC.

16:57 - 9W24 will terminate at GDP

17:00 - 9U59 and 9W60 cancelled

17:42 - East - Two high level trains (2W64 and 2W80) to run at c. 1748 and 1750

17:44 - Central - Services being stepped up at ABX. 9R92 on P3 and 9T94 onto P4

17:45 - The control team are focusing on the peak direction. Reports that Stratford station is extremely busy. DCM in the process of creating 2x special services from Liverpool Street HL.

Platform 16 2W80

Platform 17 2W64

Running all stations

17:58 - 9Y17 will be reintroduced from Gidea Park. Coming out from the CS

18:27 - Shenfield

- OC1536 - 9T71

- GP1216 - 5V86

- SH1711 - 9Y65

- GP1281 - available

- GP1219 - 9Y29

- AW1120 - 9T81

18:45 - Abbey Wood platform 3 Special service, 9Z19 all stations to Paddington LL then Old Oak Common

19:00 - Risk identified

Shenfield Driver resources, All spare/cover utilised. P&B risk highlighted due to delays. East Drivers off diagram due to the earlier diversions to Abbey Wood. A fire break created by putting a train into Gidea Park CS. DCM working closely with TCC. Only using booked drivers for their booked headcodes.

	<p>19:13 - West services recovered have been hampered due to the ill passengers. DCM has made service amendments (terminating short) to 9R06 and 9T08 as they are the same driver</p> <p>20:23 – Shenfield Platform 1 - 9Y67 Platform 4 - going into Shenfield CS Platform 5 - 9Y67 Platform 6 - 9Y65 Looking to put trains in Gidea Park CS due to lack of driver resources at Shenfield. 9W20 first train to terminate</p> <p>20:25 - TCC is now finishing their shift after working 12 hours at Shenfield. Plan is it call each driver individually to see if they can stay on to help or plan B will be to terminate at Gidea Park.</p> <p>20:33 - [REDACTED]</p>
<p>Observations (Findings / Feelings)</p>	<ol style="list-style-type: none"> 1. S&T Time to Site and Time to Resolve – 60 minutes to site and 90 minutes to resolve, once on track a quick identification and clean saw clear tracks. This timing considering that they were travelling from Ilford seems extremely protracted and requires suitable challenge to understand what opportunities exist to significantly reduce this time that has a knock on impact to services especially owing to the intensity within the peak period. Also can one member attempt to travel to site via train? 2. Train defect handling and process – 18 minutes of Conf Calls and 7 calls with the DCM/ISST seems extremely excessive in resolving such a failure, with an additional 4 calls via DCM/Signaller. It should be noted that the signaller gave authority for the train to proceed past the signal L267, the Driver then had an EB whilst passing. The delay then arose as the Driver was unable to clear the EB banner/acknowledge. Fleet download required to understand if this was a train bourn issue or Driver action within the cab so suitable briefing can take place. Also if the ISST could have done anything differently to expedite recovery. There were a few calls between the Driver/ISST where the Driver was asking the ISST if they should proceed when any such authority should come from the signaller having also spoken with the DCM. The technical process requires review to seek to avoid such protracted resolution. 3. Communications – Calls between the Driver and ISST dropped off twice which further delayed recovery of the unit. RFLi to be consulted on the recent thematic issues with the GSMR/BT Turret resilience. 4. Driver actions – Before finally moving off having completed a MCS recycle, new SOM and CBTC reset, an excess of 20 minutes had elapsed since the Driver was given authority to proceed from the Signaller. The Driver did not call the Signaller back to affirm authority to move which was queried by the Signaller with the DCM. This is worthy of follow up with the Driver as being a live operational environment much may have changed since. 5. CIS – The CEC and CEDM strived to make amendments via Darwin and Tyrell messages respectively however the system still doesn't seem as resilient as expected to maintain accurate reflection of the service at Abbey Wood with such intensity of changes. 6. Customer Experience and Crowding – Owing to such a protracted incident within the peak and extended recovery the impact and reputational loss was significant to customers and for MTR. The timetable intensity post such levels of diversions and cancelations saw significant gaps following Driver displacement and intensity of Driver

	<p>PNBs. Stations team did very well communicating the impact being led by the CEDM and line management where appropriate measures were put in place to control the flow of customers to platforms and manage resources to site, specifically Stratford and Canary Wharf to name a few.</p> <p>7. Service Recovery – From observation the DCMs worked with a great deal of focus being such a strong team however still found it challenging to recovery the service at a greater pace. This leads to a review required on identifying a more off the shelf process that needs to be theoretically tested to support recovery in alignment from withdrawing a contingency plan. There does not seem to be a base plan to follow as its dependant also on impact of Driver displacement and style of recovery balanced again a focus on keeping wheels moving to serve the peak demand flow.</p> <p>8. RCC Coverage – There were 2 SDRM late shift duties uncovered which severely contributed to the DCM workload and ability to manage their service group and Driver resource. The team persevered working closely with the TCCs and TRM. The TCC also finished duty at Shenfield having completed a 12 hour shift. Coverage resilience within the RCC requires a review to seek opportunities to avoid such safety critical roles from being uncovered, also how we can build better coverage for TCC and have an Agreed MOU with how responsibilities are divided with the TRM when there is no SDRMs on duty.</p> <p>9. Stranded Trains – whilst the ISST was working with the Driver to resolve their EB issue and obtain forward movement into TPWS the focus was on dealing with the heavily loaded trains, a good focus and support from the NR signaller who worked all 4 stranded trains around platform no 8 (9W18) via platform no 5 seeing a swift resolution. Impact still being the WB services being delayed as a consequence. Post incident review sees an opportunity if we could have diverted 9W28 by 16:27 to Abbey Wood which would have reduced a further stranded train, however it is noted this was very early into the incident and the Central DCMs did make multiple diversions to Abbey Wood and keep the wheels moving within the COS into the West minimising customer impact.</p> <p>Could the failure incident have been avoided / mitigated:</p> <ol style="list-style-type: none"> 1. Track Circuit failure – Time to site 60 minutes and Time to Fix 90 minutes to be reviewed/challenged with NR as protracted. At least 50% shaven off this time would've seen a resolution to the failure in minute 45 (expected opinion). Maintenance regime to be reviewed to mitigate such failure for early detection/prevention. 2. Train failure to Transition from CBTC to TPWS post TCF – Process and time taken to resolve emergency brake application and gain forward movement into TPWS should have been far less than the overall 57 minutes taken with an expected resolution at minute 10 with the ISST/Driver and comms with the Signaller for authority. At least 35 – 40 additional minutes lost here in resolution.
<p>Opportunities (Future)</p>	<p>Actions / Recommendations - SPIR provisionally being planned for week commencing 16th Oct where the below and further arsing actions will be affirmed</p> <ol style="list-style-type: none"> 1. Response time to Track Circuit Failure – ODM West to challenge S&T timings and review with NR 2. RCC SDRM Coverage – HOSD / DHSD to review resilience to avoid/mitigate such occurrences where possible and clear contingencies with TRM/TCC/DTM etc 3. Fix or Fail – Following Fleet feedback and further review of voice comms the technical process to be reviewed to highlight what could have been done differently to expedite recovery of the unit. Currently being reviewed by SSDO

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| | <ol style="list-style-type: none">4. Contingency Plans and Service recovery – NR were not forthcoming to initially agree a contingency plan and stated it was a complex situation owing the failure. Service Control would benefit from a more detailed Contingency plan that also outlines recovery methods to follow as best practice. Can ODM west please follow up as part of the SPIR outputs with NR. Can the DHSD please review how we develop plans to better support our DCMs to recover the service in a more systematic manner that has been theoretically thought through as a base line, this will allow the wider teams within control a more consistent approach.5. DCM actions – STSM will be conducting a further review with the DCM to understand if any opportunities exist ref dealing with the defective unit.6. SPIR actions to follow |
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To be completed and sent to Post Incident Review email group where possible before the next traffic day morning by 08:00 or within 24 hours.