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SWP 012/15

Watford Commissioning (Wembley Fringe)

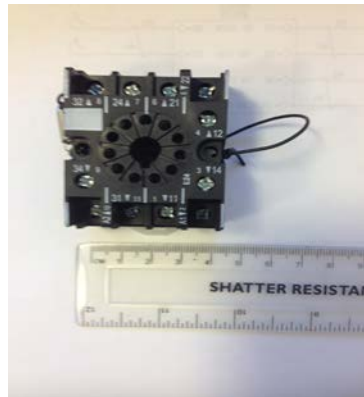
Infrastructure Projects



Background

A failure of Wembley Central interlocking after the Watford blockade at Xmas 14 occurred resulting in 71 trains cancelled, 7 part cancelled & 515 trains delayed, causing significant disruption to our travelling customers.

The cause of failure was attributed to an incorrectly wired Furse unit base in location 15/427. This was an existing base that had a strap added as part of the data link change work for Wembley Central interlocking commissioning.



The strap added to the base should have been terminated between terminals 3 to 8 however it was fitted from 1 to 3 resulting in the 100 ohm resistor not being in the circuit as designed.

Preparation

Monitoring of the data links was undertaken in September 14, well before the commissioning at Xmas, the data links reported to be healthy at that time. Two documents were viewed that documented the testing monitoring necessary, method of test and risk mitigation in case of issues, they covered Wemb Fast and Wemb Cent data links. Further checks were additionally made on the data links just prior to the commissioning.

There was no over and backing of the fringe planned, this was not feasible and the alterations had to be taken into the commissioning.

The Possession

There was a 5 day possession for the works, with the OLE switched off, no re-energisation of the OLE was planned prior to the actual commissioning.

Delays were experienced due to OLE and P'way, which resulted in re-planning having to be undertaken during the commissioning. It was estimated up to 36 hours of this time was given over to the OLE line works, these works were not originally planned during this time with signalling activities compressed at time of commissioning as a result.

Signalling was continually in a reactive state due to factors beyond its control!

The Issue

During the commissioning, a Furse unit base was incorrectly wired in location 15/427. This was an existing base that had a strap added as part of the data link change work for Wembley Central interlocking commissioning. The strap added to the base should have gone from terminals 3 to 8 however it was fitted from 1 to 3 meaning the 100 ohm resistor was not in the circuit as designed. This affected Data Link A.

(There is no local function test that would identify the incorrect strap other than carrying out a resistivity test across the outgoing data link links. This was not considered necessary).

A compounding independent failure occurred on data link B, where the Furse unit had actually failed. This was determined as having occurred during the commissioning (at time of re-energisation of the OLE after works were completed).

Identification and Rectification of the Fault

The data links remained healthy at all times, until after the traction current was reinstated on the night of 28th December, catch up testing was then undertaken as a result of severe delay due lack of access.

The faults that were manifesting were of an intermittent nature. An oscilloscope was fitted on the data links to ascertain the problem.

Faults that were experienced on the data links were not just attributable to the incorrect strap in the Furse unit, as two further existing Furse units were also changed. The faults were eventually rectified.

Action Required, Taken and Lessons Learnt

To mitigate future instances of this type of failure,

- Undertake a thorough risk assessment of the impact of allowing and accepting the programmed possession to be changed against the signalling works planned.
- If feasible, the system should be subject to data link testing prior to energisation of OLE (full system operation). It may not be possible in all cases to do this, but it should at least be considered.
- The system should be subject to data link testing subsequent to the commissioning to ensure fault free operation after intrusive modifications have been made. This is considered to be good practice.
- **(Note whilst data link testing / monitoring was undertaken on the 28th December prior to the traction current being energised, if the traction current had been re-instated to programme, the data link testing may have detected the induced Voltage. However this could not be guaranteed, as it appeared predominantly when Pendolino trains were running, which are electrically noisy with respect to interference on the route).**

Further Information...

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