

## F1158 A1

## Formal Investigation Terms of Reference

**Incident: Fracture of the longitudinal beam on the 96 tube stock**

**Date: 17 October 2019**

A formal investigation is commissioned into the identification of a safety issue on some Jubilee line trains. When the issue was identified, all Jubilee line trains were withdrawn from service (in a phased process) on the evening of 17 October for detailed inspections. These inspections and further detailed inspections were carried out over the following days. The LU Major Incident Command Group was established on 17 October to ensure that LU operated a safe railway and to address the issues identified.

The purpose of this investigation is to determine the causes of the incident and to identify any measures necessary to suitably minimise the risk of recurrence (not to establish blame or liability).

The investigation should:

- Establish the sequence of events that led to the incident.
- Identify why the incident occurred in terms of immediate cause, causal factors and root causes.
- Identify any actions already underway to address the root causes.
- Develop reasonably practicable recommendations to address the root causes.
- Consider previous or similar incidents.
- The investigation should address the root causes in relation to the running of a safe railway, but not the long term engineering solutions to the repairs, which will be subject to a separate assurance process.

The investigation should pay particular attention to:

- Understand the root cause which led to the fractures on the Jubilee line
- Design of the coupling plate (and any other relevant elements of the rolling stock), how it differed from other similar designs on LU rolling stock (e.g. the Northern line) and whether the risk of fracturing was considered during defining of the maintenance regime.
- Learning from other LU rolling stock and other railway organisations in design of the coupling plate for Jubilee line.
- The maintenance regime for the Jubilee line, specifically post introduction of the 7<sup>th</sup> car, and specifically whether the maintenance regime considered and addressed this risk?
  - If there was a defined maintenance regime, was this maintenance regime delivered?
    - If so, consider why the maintenance regime was not effective (the fractures not picked up)?
    - If not, why not? What was the assurance regime in place for reporting on delivery of planned maintenance?
  - If there was no clear maintenance regime, why not?
- The assurance regime for managing this risk on the Jubilee line rolling stock.
- The response to this risk in ensuring the safe operation of the Jubilee line and the LU network overall, specifically
  - The response on evening of 17 October and in the following days
  - The approach taken after the immediate response, e.g.
    - Was the appropriate inspection regime put in place for these trains?

- Was appropriate safety assurance put in place (including reporting on this safety assurance to relevant people)?
- The approach taken in relation to other LU fleet.

The Senior Manager leading the investigation panel is Claire Porter, supported by:

- Kate Hagan, Lead investigator, LU
- Kevin Crofts, Independent rolling stock specialist (someone who will understand rolling stock engineering/assurance)
- Claire Maclean, TfL Engineering – Rolling Stock
- Steve Whysall, TfL Engineering – Rolling Stock
- Lee Milledge, Asset Operations Fleet
- Marian Kelly, Safety, Health & Environment
- Steve Cordell, Safety, Health & Environment
- Graham Stanbridge, Health and Safety Representative RMT (trains)
- Martin Bell, Health and Safety Representative ASLEF (trains)
- Christopher Green, Health and Safety Representative RMT (fleet)
- Michael Peralta, Health and Safety Representative Unite (fleet)

An interim report will be shared with the LU MD and LU Directors by 6 December 2019.

The date for submission of the full investigation report to the Commissioning Director and for approval and presented to DRACCT for final review and approval will be confirmed by 6 December.

**Peter McNaught**  
**Commissioning Director**  
**Director of Asset Operations, London Underground**

