



Responsibility for the regulation of health and safety on the railways was transferred from the Health and Safety Commission (HSC) and Health and Safety Executive (HSE) to the Office of Rail Regulation (ORR) on 1 April 2006.

This document was originally produced by HSC/E but responsibility for the subject/work area in the document has now moved to ORR.

If you would like any further information, please contact the ORR's Correspondence Section - contact.cct@orr.gsi.gov.uk

Derailment at Chancery Lane, 25 January 2003

Introduction

1. At around 13.50 on 25 January 2003 a London Underground Limited (LUL) westbound Central Line train derailed as it came into Chancery Lane station. The train had around 500 passengers on board, and the last four cars of the eight-car train were derailed. Although there was little structural damage, three of the cars were damaged due to impact with the tunnel wall and station platform, with one of the doors being ripped off and a number of windows broken. 32 passengers received relatively minor injuries such as cuts, bruises and, in one case, a broken ankle. LUL staff promptly evacuated passengers on the train. There was no fire, although the derailment generated a lot of dust.

Background

2. The train was composed of 1992 Tube Stock (92TS), built by British Rail Engineering Limited (now Bombardier Transportation). The trains were built between 1991 and 1994 and entered service between 1993 and 1995. Under the provisions of the Public-Private Partnership (PPP) contract, LUL operates the trains, which at the time of the incident were maintained by Infraco BCV Ltd (iBCV), a subsidiary of LUL. Maintenance of this rolling stock passed subsequently to Metronet Rail BCV Ltd (MRBCV) in April 2003.

3. In 2001, maintenance checks found two traction motors detached from their mountings on the underside of carriages at Hainault. However, the motors did not fall onto the track because in one case safety brackets prevented this, and in the other incident the size of the failed assembly was too great to fall out of the bogie. In September 2002 a train derailed while entering the sidings at Loughton, having been taken out of service following reports of unusual noise. Again, the traction motor primary mounting bolts had failed, but this time the safety brackets also failed, and the motor fell onto the track causing the derailment.

The derailment

4. On 25 January 2003 at c. 13:28 the line controller based at the Central Line Control Centre received a report of unusual noises on Train 002. He tried to confirm this, and after a number of conflicting reports from station staff and drivers, decided to take the train out of service when it reached Holborn, this being the closest siding where the train could be kept without blocking the line. At c. 13:50pm the train derailed as it reached Chancery Lane station, about 600m short of Holborn. It is estimated that 500 passengers were on board Train 002 at the time of derailment.

5. The immediate cause of the derailment was the detachment of the rearmost traction motor on the fifth car, itself caused by a gearbox failure.

There was insufficient space for the following axles to pass over the motor, resulting in the derailment of five of the sixteen bogies on the train, starting with the rear bogie on the fifth car.

The HMRI investigation

6. HMRI's investigation concentrated on two broad areas. First, the response of iBCV and LUL to the engineering problems with this particular stock (92TS), and in particular their response to the previous traction motor failures. This looked in some detail at the adequacy of their investigations and analyses of causes, as well as the results, i.e. corrective actions, modifications and temporary measures. Second, the investigation considered LUL's operational response to the reported problems with Train 002, and in particular the line controller's attempts to confirm the reports of defects, and the appropriateness of decisions taken in the minutes leading up to the derailment. As well as interviewing witnesses, the investigation also commissioned specialist reports on the site evidence and vehicle crashworthiness, examined the vehicle bogies, analysed the human factors of the decision-making process in the control room, and the effectiveness of the temporary measures.

Key findings from the investigation

(1) Engineering Issues

7. The investigation found that until late 2002 neither LUL nor iBCV considered the traction motor mounting failures to be an issue that could affect safety. This was because it was believed that if the motor fixings did fail, the motor would be prevented from falling onto the track - and causing a derailment - by the safety brackets. After the Loughton derailment in September 2002, although it was believed to be an isolated incident, iBCV, with the support of LUL, implemented enhanced checks on the tightness of motor mounting bolts. The frequency of checks increased from once every 90 days to every 5 days, the maximum frequency consistent with being able to run a full service every day.

8. IBCV commissioned independent reports into the causes of the 2001 Hainault and 2002 Loughton incidents. They also worked closely with LUL engineers. All the indications in 2001-02 were that the problems lay with design weaknesses with the mounting assemblies and safety brackets. Within the industry at this time it was not thought that a gearbox failure could cause a derailment. Checking the tightness of the mounting bolts every 5 days was seen as a reasonable precaution to deal with the risks as they were understood at the time. Although not perfect - the spanner checks could not detect whether the bolts were tight enough, only that they were not loose - the opinion of engineers in LUL and iBCV was that this adequately addressed the risks.

9. In the light of the knowledge available at the time, the actions of iBCV and LUL fell within the range of a reasonable response. They made

responsible efforts to find out the cause of the failures; in the absence of clear indications to the contrary and using engineering judgment based on their knowledge of the risks at the time they identified what they believed to be the cause of the failures and they devised and implemented appropriate safety measures.

(2) Operational Response

10. The line controller received the first report of a possible train defect at 13:28. The train derailed at c. 13:50, shortly after a decision had been made to take the train out of service at Holborn, approximately 600m short of that point. The line controller did not receive any report that clearly indicated significant problems with the train. The reports were of unusual noises (two reports) and dusty tunnel conditions (one report). In response, the line controller asked a member of staff to travel on the train, and for another member of staff to observe the train through Liverpool Street station. Neither person reported anything unusual. In this respect the line controller made the right decision and erred on the side of safety in the face of conflicting information.

11. Given the history of problems with traction motor mountings the investigation has found that LUL could have done more to alert line controllers to the possible significance (i.e. risk of derailment) of noises from underneath trains and the need to consider withdrawal earlier. Had they done so, the line controller might have withdrawn the train from service earlier. However, it is questionable whether requiring line controllers to do this is a reasonably practicable step to take. Line controllers were required, for safety reasons, to take trains out of service in the event of unusual noises, the consequence would be to withdraw more trains than at present, increasing consequential risks from station and train overcrowding due to service disruption. In simple terms, the line controller has no way of knowing whether a report of a noise from underneath a train is a safety-related problem or not, and to require them to withdraw every train making noises would very likely create more risks than it would avoid. It would not be reasonable to expect LUL to respond to unusual noises in this way, and LUL would be correct to consider the creation of additional risks when deciding what would be a reasonably practicable response.

Lessons learned

12. In hindsight LUL and iBCV made mistakes before the derailment. In particular, weak management of investigations into the 2001 Hainault and 2002 Loughton incidents meant they could have been completed more quickly and been more wide-ranging and less bound by engineering assumptions about their causes. However, there is no suggestion that this directly led to the Chancery Lane derailment taking place. Also, the means for communicating technical issues from iBCV to line controllers could have been more robust, as could line controllers' access to technical advice. LUL's own investigation report into the derailment made seven primary and seventeen secondary recommendations. These included action points aimed at

addressing the above issues. HMRI has monitored progress with implementation of these recommendations and is satisfied that LUL and MRBCV have acted to learn the lessons from the derailment to help prevent another similar incident. HMRI has also carried out inspections of rolling stock maintenance in the past. More work on this topic is planned for this year.

Conclusion

13. The evidence is that the responses to the previous derailments by LUL and iBCV (now MRBV) although capable of improvement, fell within the range of being reasonable in the light of available knowledge and industry practice at the time. Likewise, although with the benefit of hindsight, LUL's operational response could have been improved their response - based on existing knowledge and practice - was not unreasonable. In these circumstances it is believed that there is not the evidence to sustain formal enforcement action against LUL and MRBCV being taken by HMRI.

Decision on enforcement action

14. The decision not to take formal enforcement action has been taken in accordance with the process and criteria set out in the Code for Crown Prosecutors, and the Health and Safety Commission's (HSC) Enforcement Policy Statement. The Code makes it clear that the decision to prosecute is based on two tests:

'The first stage is consideration of the evidence. If the case does not pass the evidential stage it must not go ahead no matter how important or serious it may be.' (para. 5.1)

15. The HMRI investigation has found that there is insufficient evidence to support a prosecution. In particular, there is no evidence to rebut a defence that it would not have been 'reasonably practicable' for LUL or iBCV to have done more to prevent the derailment. In simple terms, the evidence is that LUL and iBCV did what was reasonably practicable. In accordance with the Code, no further consideration is given below to whether any cases meet public interest criteria.

16. The HSC Enforcement Policy Statement requires that the decision to prosecute *'should take account of the evidential test and relevant public interest factors set down by the Director of Public Prosecutions in the Code for Crown Prosecutors. No prosecution may go ahead unless the prosecutor finds there is sufficient evidence to provide a realistic prospect of conviction, and decides that prosecution would be in the public interest.'* (para. 35)

17. This report closes out HMRI's investigation into the derailment at Chancery Lane.