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Ms Carolyn Griffiths
Chief Inspector of Rail Accidents
Rail Accident Investigation Branch
Block A 2nd floor
Dukes Court
Dukes St
Woking GU 21 5BH

Dear Carolyn

Highgate runaway

I write to report¹ on the consideration given and action taken in respect of the 7 recommendations addressed to ORR in the above report published on 15 June 2011.

The annex to this letter provides details of the actions taken in respect of each recommendation where all 7 recommendations have now been implemented².

We do not propose to take any further action in respect of these recommendations unless we become aware that any of the information provided becomes inaccurate, in which case I will write to you again³.

We expect to publish this response on our website on 8 June 2012.

Yours Sincerely

Chris O'Doherty



¹ In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005

² In accordance with regulation 12(2)(b)(i)

³ In accordance with Regulation 12(2)(c)

Initial consideration by ORR

1. All 7 recommendations contained in the report were addressed to ORR when RAIB published the report on 15 June 2011.
2. After considering the report and recommendations ORR passed all 7 recommendations to London Underground Ltd (LUL) asking it to consider and where appropriate act upon them and advise ORR of its conclusions. The consideration given to each recommendation is described below.

Recommendation 1

This recommendation is intended to provide sufficient and appropriate inputs to the future introduction of new and modified engineering trains and rail mounted plant.

LUL should, with assistance from Tube Lines, review and, where necessary, amend processes and practices so that adequate design, checking, approval and testing is provided for new and modified engineering trains and rail mounted plant. The processes and practices should include specifying and allocating sufficient staff with appropriate qualifications, defining the individual responsibilities and providing effective coordination between them.

Details of steps taken or being taken to address the recommendation

3. In its response of 29 July 2011 LUL confirmed it had completed the following actions:

Action 1/FIR 4: *Reviewed the TLL and LU plant and rolling stock approvals processes to ensure it contains an appropriate level of independence, peer review and integration with associated process (e.g. change control and approvals / assurance regimes). This has clarified the definitions of plant and rolling stock and the competence required for sign off and has been informed by the findings from recommendation 6*

*Tube Lines has published a new procedure P-936 Approval of Plant, Tools and Equipment (**attachment 1**) that categorises how plant approvals will be managed, recognising the risk. For clarity all approvals of new or altered Engineers Trains and associated equipment and recovery procedures follow the full Assurance process (Tube Lines Procedure P308, LU Category 1 Standard 1-538). Certificates of Technical Conformity being issued for initial implementation and any subsequent modifications signed off by TLL and LUs Rolling Stock Engineers and peer review at Tube Lines Safety Review Group;*

Action 1/FIR 8: Reviewed the purpose, approval and change control of OSP&Is to provide assurance that risks are being appropriately managed consistent with OSPs, emergency plans and the LU Rule Book.

All Operational Safety Plans are signed off by Transplant. Any Operational Safety Plans requiring protocols that are outside of the published Rule Book are subject to review and approval at 'Directors Risk, Assurance and Change Control Team' (DRACCT).

4. LUL also reported it was in the process of completing the following actions with an expected completion date of September 2011:

Action 1/FIR 10: a) Re-writing guidance note G-184 'Guide to the acceptance of third party vehicles' as a LU standard in consultation with TLL. The standard should address the operation and rescue of engineers' vehicles and fundamental railway safety principles (automatic train protection, signalling, braking and secondary retention);

b) Updating the LU Rule Book and competence management systems to reflect any changes in requirements arising from 10a.

5. In an updated response on 28 October 2011 LUL provided ORR with copies of Rule Book 4 'Moving a stalled train and authorised detainments, Rule Book 18 'Engineer's trains, vehicles and trolleys' and Guidance Note 'G-184 'Guidance to the acceptance of third party vehicles and confirmed these have been updated in light of the recommendation.

ORR decision

6. ORR in reviewing the responses and considering the documents provided by LUL concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: Implemented

Recommendation 2

This recommendation is intended to identify and remedy any existing approvals where the extent of specialist inputs may have been insufficient to provide

reasonable assurance of compliance with the standards applicable at the time of approval.

In respect of engineering trains and rail mounted plant supplied by (or through) TransPlant: LUL should, with assistance from Tube Lines, review all existing approvals to determine whether the inputs to the approval process were sufficient to give reasonable assurance that adequate safety standards are met by safety critical equipment, operating procedures and documentation. If inputs were insufficient to give this assurance, LUL, with assistance from Tube Lines, should introduce a time-bound process to implement the measures needed to comply with appropriate safety standards.

Details of steps taken or being taken to address the recommendation

7. In its response of 29 July 2011 LUL confirmed it had completed the following actions:

Action 2/FIR 1: *Revised the requirements for RGU approval taking account of the findings of this FIR and the Structural Engineer's report regarding the RGU inter-car and emergency couplers. Compliance with the revised requirements to be demonstrated through the formal acceptance process prior to use on the LU network.*

The Structural Engineers report informed the re-design activities. Design peer reviewed as part of sign off of the CTC by LU and TLLs Rolling Stock engineers;

Action 2/FIR 2: *Reviewed the emergency plan, OSP&I, risk assessments and other documentation associated with the operation of the RGU using the lessons learnt from this FIR.*

Advice was sought from LU Operational standards regarding the applicability of the Rule Book and OSP&I and any training requirements for LU COO teams, and as included in OGN002. A comprehensive emergency plan detailing the method of rescue of the RGU is summarised in OGN002 and in an updated OSP. OGN002 has been briefed to the RDOs and TLL IDOs at the regular liaison meeting;

Action 2/FIR 5: *Reviewed all current vehicle related OSPs and OSP&Is to ensure they contain appropriate instructions for normal, degraded and emergency conditions. The review was designed to identify any potential single point failures and take account of combinations of incidents / unplanned events and the findings of recommendation 7. The review was to prioritise OSPs & OSP&Is that address vehicle use where rescue or recovery may required*

No items were identified for action in the OSP's. Comments on clarifications, improvements or changes passed to TransPlant and LU Team regarding OSP&I's;

Action 2/FIR 6: *For each type of emergency coupling system used on engineer's vehicles, a desktop assessment was carried out to determine if they have any of the design flaws associated with the emergency coupler arrangement used on the RGU. This focused particularly on novel designs or where height variances are present.*

The coupling for Tampers identified as not verified as fit for purpose. Tube Lines Prohibition Notice on use issued (TL-PN-2011-0001). Subsequent verification has determined coupler is fit for purpose, but that instruction to NDT test after each use to be put in place and prohibition then withdrawn.

8. LUL also reported it was in the process of completing the following actions with an expected completion date of September 2011:

Action 2/FIR 7: *Review the emergency plans for all engineers' and miscellaneous vehicles to ensure adequate arrangements exist for rescue. With appropriate involvement of Rolling Stock Engineers and LU Operations and with particular reference to:*

- *type of assisting vehicle (passenger or engineering),*
- *braking capacity,*
- *secondary retention,*
- *selection of route (gradient, direction, track features etc.)*
- *authority to move mixed vehicle formations,*
- *The role of service control and recommendation 11;*

Action 2/FIR 9: *a) Assess with Transplant the risk from un-braked units and develop reasonably practicable actions to ensure risks are appropriately controlled.*

b) The assessment should identify any changes required to engineering, Rule Book and competence based controls and the findings from recommendation 7.

A Review has been completed and report drafted which is being reviewed by LU Rolling Stock Engineers. This informs action FIR 7 above.

9. On 28 October 2011 LUL provided ORR with a copy of the Test of Tow Bar report together with a copy of the testing methodology. It also confirmed that reviews of relevant OSPs (Operational Safety Plans) and OSP & Is (Operational Safety Plans and Instructions) have been completed. Common issues across the documents were identified in addition to document specific issues that have been actioned with relevant OSP & I owners. The OSP & I for the rail grinder has been rewritten and was resubmitted for approval as part of the grinder approval process.

ORR decision

10. ORR in reviewing the responses and considering the documents provided by LUL has concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: *Implemented*

Recommendation 3

This recommendation is intended to provide sufficient experienced staff involvement to the investigation of allegedly defective equipment so that lessons are learnt from equipment malfunctions before these result in an accident.

LUL should, with assistance from Tube Lines, review and, where necessary, amend the processes and practices used to investigate allegedly defective equipment. This review should cover the specification and implementation of adequate testing and the assessment of both defects and test results.

Details of steps taken or being taken to address the recommendation

11. In its response of 29 July 2011 LUL explained that the following actions were in progress with an expected completion date of October 2011:

Action 3/FIR 1: *Tube Lines learning is that having established learning from the incident any re-design or alterations need to be considered from first principles and thus treated as a project for re-instatement. Thus deploying the New / Altered Assets Procedure P-308. The requirements being informed by the incident investigation. This was deployed post the Archway Grinder Runaway and resulted in an approach based on achieving a Design Specification, Declaration of Design Compliance (TLF302), formal Test Plans (TLF303) and the issue of the Certificate of Technical Conformity (CTC), noting the CTC process ensures collaboration between TLL and LU Rolling Stock Engineers.*

Procedure P-308 to be specifically updated to define the requirements and how it is deployed in post incident situations. This will include how this is done and how the relevant elements of the process are selected to be deployed, thus enshrining the good practices deployed since the Grinder Incident;

Action 3/FIR 2: *Tube Lines is also reviewing its Incident and Post Incident response procedures in collaboration with the relevant LU Heads of Profession with a view to incorporation of the Grinder Incident learning and how requirements will inform the processes described in 3/1 above. (To include review of TLL-ENG-S6010 Post Incident and Post Accident Examination and Testing of Rolling Stock)*

12. On 28 October 2011 LUL provided ORR with copies of revised standard TLL-ENG-S6010 'Post Incident and Post Accident Examination and Testing of Rolling Stock' and P-308 'Assurance of New and Altered Assets'. LUL confirmed that both documents have been revised following the incident and are currently going through the Tube Lines approval process prior to issue. The key changes are in section 5.4.2 of TLL-ENG-S6010 and 7.16 of P-308. These sections require that where engineering design is identified as a causal factor in an incident, the relevant materials are risk evaluated in a planned manner using the appropriate competent technical staff.

ORR decision

13. ORR in reviewing the responses and considering the documents received from LUL has concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: *Implemented*

Recommendation 4

This recommendation is intended to clarify the responsibilities of, and provide adequate instructions and training for, people involved in the recovery of engineering trains and rail mounted plant. The training process should include a means for identifying and resolving any problems, or improvements, identified during the training.

LUL should, with assistance from Tube Lines, review and clarify the responsibilities of all staff who may be involved in the recovery of engineering trains and rail mounted plant. Where necessary, processes should be implemented to provide these staff with appropriate instructions, training and practice. This training process should include appropriate actions to be taken if problems, or possible improvements, are identified during training

Details of steps taken or being taken to address the recommendation

14. In its response of 29 July 2011 LUL confirmed the following actions as being complete:

Action 4/FIR 1: *The roles and responsibilities for the management of the recovery activities are clearly defined in the OSPs and OGNs. The Standard developed from FIR 10 will define the parties to be included and hence the action is repeated in this section.*

The re-instatement activities for the Grinder were led by Transplant in establishing the new recovery arrangement. ERU were consulted, noting they are not required to support routine recoveries. This included learning from the tests conducted on the revised arrangements.

Action 4/FIR 11: *Reviewed the command and control arrangements for the management of incidents involving engineers' vehicles from an LU Operations perspective. This included overall control of the incident, liaison with 3rd party*

contractors, the use of passenger trains, authority to move, escalation to the Senior Operating Officer (SOO) and the requirements of OSN 96. Any competence requirements identified should be reflected in the relevant CMS documentation OSN96 communicated and implemented requiring any unusual movements of vehicles with restricted braking beyond that included in the Rule Book to be escalated to the SOO. Site Management of the recovery of the Grinders and Millers confirmed under a Competent Transplant Duty Manager as described by the OGN Guidelines now available in the Rule Book supporting information, **attachment 3**. Recovery for the Grinders/Millers all by Engineering Trains. (Note 3 Transplant Managers confirmed as competent at present given their involvement in the tests and trials of the revised arrangements, including the Transplant General Manager, who will authorise others as confirmed competent).

15. LUL also reported on 29 July 2011 it was in the process of completing the following actions with an expected completion date of September 2011:

Action 4/FIR 10: a) Re-write guidance note G-184 'Guide to the acceptance of third party vehicles' as a LU standard in consultation with TLL. The standard should address the operation and rescue of engineers' vehicles and fundamental railway safety principles (automatic train protection, signalling, braking and secondary retention).

b) Update the LU Rule Book and competence management systems to reflect any changes in requirements arising from 10a

16. On 24 August 2011 ORR wrote to LUL asking for:

a clarification of what is meant by routine and non-routine recovery and an explanation of when the ERU will be expected to support a recovery; and

b further explanation into how training is addressed

17. In response, LUL provided the additional information below on 28 October 2011:

a In this context routine recovery means when the Grinder power system has failed and has to be towed back to a depot using the pre-determined recovery procedure and in this instance ERU are not required. Transplant will resource and manage this activity as per Guidance Note OGN002. Non-routine means when the Grinder has been damaged such that the pre-determined recovery plan alone cannot be deployed to achieve recovery;

b The main change in the new organisation arrangements is the introduction in OGN002 of the role of a Competent Manager from Transplant to oversee the recovery. Initially 3 Transplant Managers were deemed competent to perform this role, through their experience of overseeing and/or witnessing the testing and trials of the new arrangements and the new coupler. Since then the Duty Depot Managers (DDMs) have also been trained in the recovery procedures to broaden the pool available to oversee recoveries by the Transplant Training Manager. Fitting the coupler to the recovery battery loco is a safety critical activity and is included in the Engineers Train Operator Training and Licensing. Fitting of the coupler at the

Grinder end is verified by the Schweerbrau Operator and this is included within their training regime. A nominated ERU Manager has been briefed in the new arrangements for the grinder noting that ERU are not required to manage the routine recovery activities in the event of power system failures as in a) above.

ORR decision

18. ORR in reviewing the responses and additional information received from London Underground Ltd has concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: *Implemented*

Recommendation 5

This recommendation is intended to minimise the risks associated with the operation of unbraked vehicles at the end of trains.

LUL should, with assistance from Tube Lines, provide guidance and instructions to ensure a safe system of work to recover vehicles with defective or ineffective braking.

Details of steps taken or being taken to address the recommendation

19. In its response of 29 July 2011 LUL confirmed the following actions as complete:

Action 5/FIR 12: *Reviewed what information and guidance is available to Service Control staff when making emergency response decisions on the operational railway.*

*New section added to the Rule Books and Support Information Intranet site to cover Operating Guidelines for Engineering Trains and Vehicles, **Attachment 2** shows the webpage. This now includes specific Operational Guideline for vehicles that may require protocols outside of those covered by the Rule Book or not regularly handled. The information is available to everyone, and specifically targeted to inform Service Controllers, RDOs and others managing incident situations. **Attachment 2** includes OGN002 covering the Schweerbau Grinders*

ORR decision

20. ORR in reviewing the responses and additional information received from LUL has concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: *Implemented*

Recommendation 6

The intention of this recommendation is to identify any shortcomings in the quality assurance processes applied to organisations supplying TransPlant with plant and equipment including design services.

LUL should audit Tube Lines' supplier quality assurance system, as applied to TransPlant's suppliers, with particular emphasis on ensuring that responsibilities for design, checking and approval are clearly defined and then allocated only to people and organisations which have been verified as having the necessary competencies. LUL should close out this audit after ensuring that Tube Lines have undertaken any necessary corrective actions

Details of steps taken or being taken to address the recommendations

21. In its response of 29 July 2011 LUL confirmed that the following action was in progress:

Action 6/FIR 1: *A joint LU/TLL Audit is being scoped to complete this recommendation. Any resultant recommendations and/or CARs will be treated as actions in support of the response to the RAIB report. The Audit will consider both scenarios of internally led design and where elements are contracted to a supplier, recognising the importance of integration of these activities and how these are controlled by Transplant Engineering Manager.*

The Audit Scope will be informed by a review of HSE publication L144 Managing health and safety in construction to ensure the audit verifies the clarity of the designers responsibility between Transplant and its suppliers.

22. ORR wrote to LUL on 24 August 2011 requesting details of the outcome of the audit.. The information below together with a copy of the report and resulting action plan, was provided by LUL on 28 October 2011

A joint audit between Tube Lines and London Underground on supplier assurance as applied to Trans Plant was carried out in accordance with a recommendation by the Rail Accident Investigation Branch in relation to the runaway rail grinder incident in August 2010. The report and supporting action plan has been agreed by the DRACCT meeting and a copy of the report is attached below. The actions will be tracked to completion by London Underground Ltd

The audit scope included assessing compliance within Transplant Managed design projects, this is not a common activity for Transplant. The audit identified a number of procedural non-compliances, although noted that the re-design and manufacture of the rail grinder coupler was subject to an appropriate degree of scrutiny as described in this and other responses to ORR. Assurance was validated by London Underground Ltd and Tube Lines Engineers with no reliance on supplier assurance.

ORR decision

23. ORR in reviewing the responses and additional information received from LUL has concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: *Implemented*

Recommendation 7

The intention of this recommendation is to identify any shortcomings in the quality assurance processes applied within LUL in relation to the supply of safety critical design services by Tube Lines and organisations working for Tube Lines.

LUL should review the level of assurance provided by LUL's audit regime for the design elements of safety critical services provided to LUL, by Tube Lines and its suppliers. If the existing audit regime does not provide an adequate level of assurance, LUL should introduce a time-bound process to implement the measures needed to achieve an adequate level of assurance.

Details of steps taken or being taken to address the recommendation

24. In its response of 29 July LUL confirmed the following actions were in progress with an expected completion date of October 2011

Action 7/FIR 1: *A joint LU/TLL Audit is being scoped to complete recommendation 6 as action 6/1 above which will inform review of the surveillance and audit activities needed in this area.*

Action 7/FIR 2: *Tube Lines is reviewing the risks in this area and documenting in a TLF245 Assurance Assessment and Surveillance Plan. This considers the risk profile of the activities and hence the appropriate assurance activities to monitor this.*

25 ORR wrote to LUL on 24 August 2011 requesting sight of the outcomes of the review. On 28 October 2011 London Underground confirmed the significant outcomes and actions are included in the joint audit report for recommendation 6. London Underground Ltd also provided ORR with copies of two TLF-245 documents covering Transplant and Maintenance Plant equipment. These two documents record the strengthened review and surveillance activities for plant and engineering trains.

ORR decision

26 ORR in reviewing the responses and additional information received from LUL has concluded that in accordance with the Railway (Accident Investigation and Reporting) Regulations 2005, it has:

- taken the recommendation into consideration; and
- taken action to implement it.

ORR does not therefore propose to take any further action unless we become aware that the information reported above is inaccurate in which case we will write to RAIB again

Status: *Implemented*