

Oliver Stewart
RAIB Recommendation Handling Manager
T: 020 7282 3864
M: 07710069402
E-mail oliver.stewart@orr.gov.uk

2 August 2021

Mr Andrew Hall
Deputy Chief Inspector of Rail Accidents
Cullen House
Berkshire Copse Rd
Aldershot
Hampshire GU11 2HP

Dear Andrew,

**Signal passed at stop and near miss, Deansgate-Castlefield tram stop,
Manchester, 17 May 2019**

I write to report¹ on the consideration given and action taken in respect of the recommendations addressed to ORR in the above report, published on 3 August 2020.

The annex to this letter provides details of actions taken in response to the recommendations and the status decided by ORR. The status of recommendations 1 and 3 is '**Implementation on going**'. The status of recommendation 2 is '**Implemented**'.

ORR will advise RAIB when further information is available regarding actions being taken to address these recommendations.

We will publish this response on the ORR website on 3 August 2021.

Yours sincerely,



Oliver Stewart

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

Initial consideration by ORR

1. All 3 recommendations were addressed to ORR when the report was published on 3 August 2020.
2. After considering the recommendations, ORR passed them all to Keolis Amey Metrolink asking them to consider and where appropriate act upon them and advise ORR of its conclusions. The consideration given to each recommendation is included below.
3. ORR also brought the report and recommendations to the attention of LRSSB so that they can pass onto their members as it was concluded that that there are equally important lessons for them. ORR did not ask for a reply.
4. This annex identifies the correspondence with end implementers on which ORR's decision has been based.

Recommendation 1

The intent of this recommendation is that Keolis Amey Metrolink should reduce the risk of trams passing signals at danger or stop.

Keolis Amey Metrolink should review, update and re-implement its strategy for managing the risk of trams passing signals at danger or stop. The revised strategy should include consideration of:

- the causes of signals passed at danger and stop (including loss of attention)
- how the risk of passing signals at danger or stop can be controlled and reduced, including the possible role of future technologies
- the network's current service patterns, vehicles, equipment and infrastructure and any changes proposed in these areas
- how this strategy will encourage the reporting of safety incidents and ensure the investigation of incidents and the management of staff involved in them are based on and promote the principles of just culture
- how this strategy will be supported by a wider understanding of risk across the network
- how senior managers will exercise assurance and provide safety leadership in this area
- arrangements for regular review and update of the strategy.

ORR decision

5. KAM, in conjunction with TfGM have identified a number of measures aimed at reducing the number of SPAS incidents. KAM planned to publish the SPAS reduction strategy and 'Reducing SPAS/D on the Metrolink Network – A Driver's Guide' by the end of July 2021. ORR will review the strategy once it has been issued and consider whether it meets the requirements of the recommendation.

6. In addition to the SPAS strategy, we are aware from engagement with KAM and TfGM regarding Sandilands recommendations 3 and 4 that work is being done to upgrade the traction brake controller (TBC) to incorporate a vigilance system.

7. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, KAM has:

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

Status: *Implementation on going.* ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

Information in support of ORR decision

8. On 16 October 2020 Keolis Amey Metrolink provided the following initial response:

The reduction of SPAS and SPAD incidents is a primary operational safety objective of KAM and TfGM's joint three-year strategic business plan (2019-2021). We have identified a number of areas of action to drive improvements in SPAS / SPAD incident performance as part of our strategic plan. These actions are managed and monitored through the cross-functional working group consisting of both KAM and Transport for Greater Manchester (TfGM) representatives and involving workforce health and safety representatives.

SPAS performance improvement initiatives include;

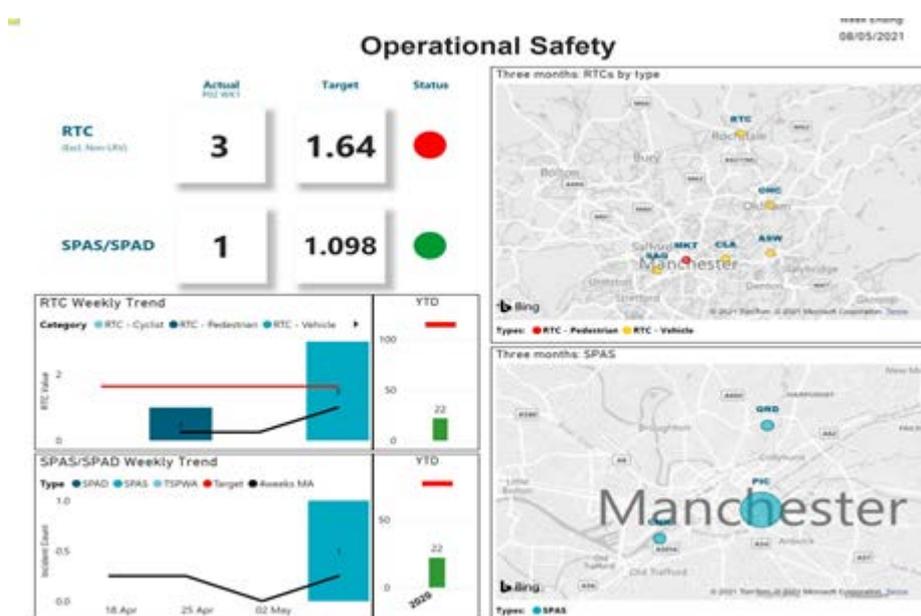
- *The re-structure of the Driver Management organisation. We have invested significantly in Driver Team Manager roles to enable greater frontline engagement. This investment has provided for more effective training and assessment, greater H&S awareness, improved wellbeing and personal performance management to drive continuous improvement.*
- *Improving awareness of SPAS and SPAD incidents, including the creation of a SPAS awareness handbook for drivers.*
- *Improving SPAS incident investigation standards.*
- *Improving incident data capture and analysis (e.g. identifying network SPAS hotspots)*
- *Relocating problematic signals*
- *The implementation of a just culture policy and procedure to ensure a fair and consistent approach to unsafe acts and behaviours and promotion of a culture where adverse events lead to organisational learning.*

KAM notes the RAIB recommendation and will review the existing SPAS and SPAD reduction plan as part of forthcoming strategic business planning activities for 2021, which are to commence prior to the end of 2020. I propose to provide you with a progress update on this workstream in January 2021.

9. On 12 May 2021 Keolis Amey Metrolink provided the following update:

Recommendation 1 (SPAS/D Reduction Strategy)

The reduction of signal passed at stop / danger incidents is a key strategic priority for KAM, forming part of our 2019-2021 and 2021-2023 business plans and is one of KAMs high level key performance indicators. On a weekly and periodic basis (every 28 days) SPAS/D incident performance, including frequency rate, hotspot signals, type of incident and cause, is reviewed through visualisation meetings hosted by functional directors and attended by all levels within the business (please below extracts of KPI data). KAM has also formed a SPAS incident reduction group, comprising members of the Driver team (including Driver Team Management, Drivers and H&S Reps), members of the HSQE and Engineering teams and colleagues from Transport for Greater Manchester (TfGM), who monitor incident performance and identify opportunities for improvement, including industry best practice and potential new technologies.



To support our business plan, the H&S Department, with the support from SPAS working group members, are in the process of creating a documented KAM SPAS Reduction Strategy that captures our approach to incident reduction, existing control measures and future planned activities / innovations to further to reduce risk. This strategy includes the creation of a guide to SPAS/D incidents created by drivers, for drivers, with input from the H&S department. I shall provide draft copies of both the SPAS Reduction Strategy and 'Reducing SPAS/D on the Metrolink Network – A Driver's Guide' by the end of May 2021.

In the interim, I have provided an overview / update on KAM's activities in relation each of the RAIB recommendation points below:

- **the causes of signals passed at danger and stop (including loss of attention)**

KAM undertakes detailed analysis of each SPAS or SPAD incident to determine the contributory factors and root cause, this analysis plays a critical part in our approach to incident reduction, enabling targeted interventions such as the relocation of hotspot signals (OLD11 signal) and or the removal of distracting, cluttered signage at PIC07s. Further improvement proposals are being formulated in relation to two other hotspot signals. The incident data is monitored at high level through the business reporting governance structure (weekly and periodic visualisation meetings) and in greater detail by the SPAS Reduction Working Group (monthly meeting) who identify areas for improvement, coordinate actions and monitor progress. Metrolink SPAS data for the last three years (2018 – 2021) has been compiled and incident types and most common causes have been established, playing a key role in prioritising the elements of KAM's strategy.

- **how the risk of passing signals at danger or stop can be controlled and reduced, including the possible role of future technologies**

KAM SPAS reduction strategy will document the existing control measures in place to prevent incident and/or reduce consequences when they do occur, along with further measures that are planned to be introduced or are to be investigated further. Existing measures include:

- *Selection, recruitment and training process (including use of psychometric testing and new tram simulator).*
- *Joint reviews of signal and signage arrangements at hotspots carried out by representatives from Service Delivery, HSE and union reps.*
- *SPAS Alert posters displayed following any SPAS events. The posters contain details of each event and specifics on lessons learned.*
- *Enhanced investigation training (Kelvin Topset)*
- *Enhanced Driver Team Management structure.*

- *Formation of SPAS reduction working group.*
- *Analysis of hotspot locations, production of hotspot maps and monitoring of actions implemented in these locations.*
- *The Training department have designed a SPAS refresh course for use the drivers Continuous Development Days (CDD).*
- *Bespoke training plans for drivers returning from prolonged periods of absence to reduce risk of operational incident.*

Forthcoming / planned actions include:

- *Driver's Guide to SPAS Reduction*
 - *Use of BowtieXP risk assessment software*
 - *Fatigue / Lifestyle guidance*
 - *Participation of the light rail Driver Innovation Safety Challenge (fatigue innovation)*
 - *Introduction of driver risk commentary techniques*
 - *Technology to meet recommendation 3&4 of Sandilands*
 - *Inclusion of SPAS/D content within driver continuous development day content, including information on SPAS hotspot signals, common causes and avoidance techniques*
- ***the network's current service patterns, vehicles, equipment and infrastructure and any changes proposed in these areas***
KAM has identified an increased risk of operational incidents, including SPAS/D, arising from changes to the network or working arrangements including; the introduction of new infrastructure, new fleet, new service patterns and driver rosters, as data shows that historically such changes have resulted in a spike in incidents. To ensure we adequately manage the risk of engineering, organisational and operational change, KAM implemented an improved suite of management of changes procedures introduced September 2020.

Also, in early 2020, KAM's Driver Management team went through a significant reorganisation to improve all aspects of employee engagement. This re-organisation has enabled KAM to move from a circa 1:200 to a 1:40 ratio of manager to driver. The success of this reorganisation has been evident during the COVID pandemic when, despite numerous changes to service patterns and rosters, trends in SPAS incidents have been extremely positively (see below SPAS/D KPI Data). We firmly believe that the improved management structure has contributed to the recent positive performance through the increased ability to engage with Drivers during what has been a challenging time of uncertainty and operational change, changes which have previously coincided with adverse operational safety incident performance.



- **how this strategy will encourage the reporting of safety incidents and ensure the investigation of incidents and the management of staff involved in them are based on and promote the principles of just culture**
Over the last 18 months KAM has made a number of improvements in the reporting and investigation process including;

- Defining the KAM Zero Harm vision – a mindset in which everyone sees themselves as a leader when it comes to safety, taking personal responsibility to manage risk and prevent harm to colleagues, passengers and the communities we serve.
- Improved investigation training (Kelvin TopSet).
- The introduction of the Stop, Think, Act, Report System (STAR) which encourages employees to identify hazards and concerns and report what they have done to address them, promoting a ‘don’t walk by’ culture.
- Revised procedures and investigation forms to ensure that human factors are fully considered and actions taken when human performance issues have been detected are just and fair.
- Developing the KAM Just and Fair response culture process (ongoing, due end of June).
- Signed up to the Confidential Incident Reporting and Analysis System (CIRAS).
- Established the several working groups comprising; frontline employees, management, employee representatives, H&S team and TfGM. One group focusses solely on SPAS and SPAD reduction, reviewing and analysing incident data and formulating actions plans. This group has been responsible for the development of The Driver’s Guide to SPAS/D reduction and relocation of hotspot signals.

All of the above elements support the KAM SPAS/D Reduction strategy.

- **how this strategy will be supported by a wider understanding of risk across the network**
KAM reports all SPAS and SPAD incidents into the LRSSB Tram Accident Incident Reporting (TAIR) tool which feeds the light rail risk model. Through analysis of the risk model, and our internal SPAS incident data, we will be able to focus on the top network wide risks, and will utilise the light rail industry BowtieXP software to assess top/most significant risks, identifying and analysing existing barriers and their effectiveness, and additional barriers required to further reduce risk.
- **how senior managers will exercise assurance and provide safety leadership in this area**
KAM's SPAS/D reduction strategy shall be endorsed by key members of the Senior Management Team (SMT) i.e. Managing Director, HSQE Director, Director of Service Delivery and Director of Engineering. Monitoring of the strategy's effectiveness is via the existing KAM Safety Meeting Governance Structure with SPAS incident performance continuing to be a key performance indicator for the business, reviewed weekly and periodically during visualisation meetings led by the KAM SMT, and via KAM/TfGM HSQE Management Meetings.
- **arrangements for regular review and update of the strategy.**
*Progress against SPAS reduction action plans are monitored through the monthly SPAS Reduction Working Group sessions and cascaded upwards via the safety governance meeting structure. Progress is also monitored through quarterly KAM SMT HSQE meetings and periodic joint KAM and TfGM HSQE meetings.
The strategy is updated annually or when circumstances change i.e. significant network changes, new risks identified, new technologies are available.*

Recommendation 2

The intent of this recommendation is that Keolis Amey Metrolink has driver medical fitness requirements that are based on an understanding of the risks of the driving task.

Keolis Amey Metrolink should review its revised medical fitness criteria for tram drivers to confirm that they effectively control the risk of the driving task. This review should be based on an assessment of tram driver work activities, the associated risk and the available risk controls. It should consider relevant law, guidance and good practice from other industries that may be applicable.

If necessary, Keolis Amey Metrolink should produce an updated medical fitness requirement for tram drivers and make changes to the associated driver assessment arrangements

ORR decision

10. The new KAM fitness standard in effect now echoes the mainline standard in most respects but is now made more demanding for general health requirements by using the DVLA Group 2 for general health, probability of loss of consciousness etc

11. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, KAM has:

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

Status: Implemented

Information in support of ORR decision

12. On 16 October 2020 Keolis Amey Metrolink provided the following initial response:

KAM has undertaken a review of our LRV Driving risk assessment to ensure the hazards associated with the operation of light rail vehicles on the Metrolink network, particularly in respect of line of sight operation and the risk of driver inattentiveness / incapacitation, are identified and adequately controlled.

The line of sight operational principle of the Metrolink network is largely reliant on the actions of the driver and their ability to respond to signals, signage and other hazards and therefore the likelihood of a driver suffering from any condition that limits this ability must be reduced as low as is reasonably practicable.

To adequately mitigate this risk, KAM has revised the relevant risk control measures to include the requirement for LRV drivers to be assessed as medically fit to DVLA Group 2 with regards to any medical condition which is likely to cause;

- a) sudden loss of consciousness,*
- b) a reduction in attention or concentration,*
- c) sudden incapacity,*
- d) a loss of balance or co-ordination,*
- e) significant limitation of mobility.*

The DVLA group 2 standard is applicable to bus and lorry drivers and reflects the hazards associated with the Metrolink network. KAM's occupational health provider has confirmed the revised medical standard introduced in January 2020 requires employees to meet DVLA group 2 requirements. This is also the case for Network Rail medical standard NR/L2/OHS/00124 – 'Competence Specific Medical Fitness Requirements', which KAM had previously adopted for safety critical staff fitness to work assessments, prior to developing our own standard. All LRV Driver medicals undertaken from January 2020, including pre-employment and periodic, are undertaken to the revised KAM standard.

Since the implementation of the revised KAM medical fitness standard the Light Rail Safety Standards Board (LRSSB) has produced a medical fitness guidance for the light rail industry. Having reviewed the industry guidance against our own standard, KAM is satisfied that both are aligned.

Further to actions outlined above, in September 2019 KAM was subject to an ORR inspection focussing on Fitness to Work arrangements. This inspection found existing arrangements to be fully compliant with ROGS requirements and provided KAM with assurance that existing management controls are appropriate and effective.

13. On 24 December 2020 KAM provided the following update:

With regards to the medical fitness standard, the line of sight operational principle of the Metrolink network is largely reliant on the actions of the driver and their ability to respond to signals, signage and other hazards, rather than engineering controls such as ATS systems, and therefore the likelihood of a driver suffering from any condition that limits this ability must be reduced as low as is reasonably practicable. Following the recommendations from the RAIB's DCF investigation we reviewed our medical standard for drivers with our healthcare provider and identified the DVLA group 2 standard general health requirement to be more suitable to Metrolink due to its stricter requirements regarding the rate of unavoidable impairment (0.02 incidents per year per person), than the PTS standard. Other elements of our medical standard e.g. vision, hearing etc remain consistent with RIS-3451.

Recommendation 3

The intent of this recommendation is that Keolis Amey Metrolink should appropriately and effectively address the risk of fatigue.

Keolis Amey Metrolink should review and improve its current fatigue risk management system for safety critical staff to confirm that it meets relevant industry guidance and best practice. This review should be based on an assessment of work activities and their associated risks and available risk controls. The review should consider relevant law, guidance and practice

ORR decision

14. We note the improvements to KAM's fatigue management arrangements including the review of its approach to fatigue management; reference to ORR's Managing Rail Staff Fatigue (MRSF) guidance; assessing fatigue risks using information from multiple information sources; and the establishment of a cross-functional fatigue working group.

15. KAM has also issued an updated fatigue procedure which further demonstrates a clear intent to improve the control of risks from fatigue. ORR has not had a chance to review the document, but will provide an update to RAIB when we have done so and also provide notification of any change to the status of the recommendation.

16. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, KAM has:

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

Status: Implementation on going. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

Information in support of ORR decision

17. On 16 October 2020 Keolis Amey Metrolink provided the following initial response:

KAM has reviewed its existing approach to fatigue management which had focussed largely on working time limits and the use of the Health and Safety Executive's Fatigue Risk Calculator. We have now developed a revised fatigue management system which we are in the process of implementing across the organisation. The new system has been designed based on the ORR's best practice guidance 'Managing Rail Staff Fatigue' and utilises a number of tools to assess and reduce fatigue risk as low as is reasonably practicable including;

- *Use of the Fatigue Risk Calculator to assess roster design / shift patterns*
- *Use of the Fatigue Factors Assessment to identify any work pattern characteristics likely to give risk to fatigue*
- *Engagement with staff to obtain anecdotal feedback on fatiguing pattern of work*

KAM has adopted a phased implementation of the new system with initial focus on LRV drivers and operational control room staff due to the risk involved in their work activities.

A cross-functional fatigue working group has been established involving employee representatives to oversee the further development and implementation of the system. To date the working group has overseen the development of a documented procedure (please find enclosed the draft KAM Fatigue Management System procedure), have gathered feedback from safety critical workers and undertook assessments of LRV Driver, Network Operations and rolling stock rosters using both the calculator and fatigue factors assessment tools in combination.

In addition to the development of the fatigue management system, KAM and TfGM are also observing the use of a personal fatigue monitoring system (DISC), currently being trialled elsewhere in the light rail industry, with a view to future use on the Metrolink network.

Work is ongoing to fully implement all aspects of the system and I propose to provide you with a progress update before the end of January 2020.

18. On 22 July 2021 Keolis Amey Metrolink provided the following update:

Recommendation 3 (Fatigue Management)

With regards to the KAM Fatigue Management Procedure we acknowledge and welcome the feedback received and are working to update our procedure to reflect this, including;

- *Removal of the working time limits and door to door travel time sections with more emphasis placed on the rostering principles found in section 4.1. It is important to note that the underpinning KAM LRV Driver rostering rules are actually aligned to MRSF guidance rather than Working Time Regulations / Hidden.*
- *Removal of FRI thresholds, greater emphasis shall be placed on the employee engagement and fatigue factors risk assessments elements of the triangulated approach. This approach has been to used good effect in relation to the assessment of operations controller's rosters, who will also be trialling the use of fatigue ready-bands.*
- *Review and update of exceedance monitoring section based on feedback and guidance.*
- *KAM are in the process of creating a fatigue and lifestyle guide for employees to support this procedure.*

Please be aware that the LRSSB will shortly be publishing a standard / guidance on fatigue management and KAM will look to incorporate any opportunities from improvement arising from this into version 2 of our procedure. We aim to able to provide you a finalised second version of the Fatigue Procedure by 30th June 2021.