Oliver Stewart
Senior Executive, RAIB Relationship and Recommendation Handling
Telephone 020 7282 3864
E-mail oliver.stewart@orr.gsi.gov.uk

OFFICE OF RAIL AND ROAD

6 October 2017

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

Dear Andrew,

RAIB Report: Freight train derailment at Angerstein Junction, 3 June 2015

I write to report[1] on the consideration given and action taken in respect of the three recommendations addressed to ORR in the above report, published on 1 June 2016.

The annex to this letter provides details in respect of each recommendation. The status of recommendations 1 and 2 is **'implemented'**; and recommendation 3 is **'progressing'.**

ORR proposes to take no further action with recommendations 1 and 2, and will advise RAIB when further information is available regarding actions being taken to address recommendation 3.

We will publish this response on the ORR website on 6 October 2017.

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 1 June 2016.

2. After considering the recommendations ORR passed recommendations 1 and 2 to all ECMs operating in the UK and recommendation 3 to Network Rail, 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 recommendations 1 and 2 and the learning point in the report to the attention of Freight Operating Companies as it was concluded that that there are equally important lessons for them. ORR did not ask these organisations to provide 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 to manage the derailment risk arising from locked up wagon suspensions by ensuring that wagon maintenance regimes facilitate the prevention of defects. This recommendation seeks completion of work that VTG has already initiated in response to the derailment. It may also be applicable to other entities in charge of maintenance for freight wagons, as the circumstances leading to suspension lock up of the type identified in this derailment may not be limited to VTG.

VTG Rail UK should review and improve the inspection and maintenance regimes for its wagons with Y25 type bogies to ensure that these adequately manage the risk arising from suspension locking up. This review should include, but not be limited to: understanding which friction surfaces in the suspension systems of its wagons with Y25 type bogies can be subject to excessive or uneven wear that could lead to suspension locking up;

- understanding the prevalence of such wear to these friction surfaces;
- amending inspection processes to allow identification of uneven wear patterns on friction surfaces;
- consideration of methods, such as measurements or physical markers, to allow identification of suspension lock up problems; and
- consideration of the use of wheel weight data sources, such as Gotcha, to identify wagon defects that can increase derailment risk.

This recommendation may also be applicable to other entities in charge of maintenance for freight wagons.

ORR decision

5. The Freight Technical Committee (FTC) formed a working group to review the inspection and maintenance regimes for wagons equipped with Y25 type bogies to manage the risk arising from suspension locking up.

6. The working group issued a single Component Maintenance and Overhaul Instruction, rather than review and update multiple documents. The document has been circulated to all keepers and ECMs for vehicles fitted with Y25 bogies. This course of action should address both recommendations 1 and 2. ORR consider the working group to have been well resourced with the right specialist skills and support the course of action taken. The work of the group has concluded and no further meetings are planned.

7. The working group was supported by most of the ECMs operating in the UK that maintain Y25 bogies. Some of the ECMs that are also wagon keepers or FOCs informed ORR of interim measures around inspection and maintenance of Y25 bogies they were taking in addition to working with the industry group. Use of Gotcha is considered a potential long-term method for detecting wheel imbalance and the use of physical markers is being trialled by Touax.

8. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, ECMs working together through the FTC working group have:

- taken the recommendation into consideration; and
- taken action to implement it, subject to formal confirmation that the work of the Y25 group has concluded.

Status: Implemented.

Information in support of ORR decision

9. VTG wrote to ORR on 5 September 2016 outlining the actions they were taking to address the recommendation:

> *The RAIB have recommended that VTG Rail UK understand the prevalence of features that could cause suspension lock on our vehicles. The VTG Group have been running Y series bogies for decades and currently have 170,000 bogies in service. Following a European- level internal review looking at the phenomena of ridged wear plates, we can state that we have never identified this as an issue across the European fleet. Therefore we do not know the prevalence of ridged wear plates within our fleet however, with the wealth of experience we have we cannot perceive that ridged wear plates have any commonality within our fleet.*
>
> *With regard to mitigating the immediate potential risk, VTG have implemented procedures that ensure our maintainers check, identify and report any ridged wear plates for further investigation by VTG. These checks happen at every lift event (approximately 60k miles) and there is a second similar check when the wheelset enters the workshop. These procedures have been implemented to address recommendation 1. VTG have however concluded that it is not practical to use the physical markers on the bogie as an identification, as they have no level of calibration and with other variables such as straight and level*

track influencing the markers accuracy VTG have decided not to implement this.

The final point from recommendation 1 is that VTG considers using Gotcha to mitigate risk of unbalanced loads on wheelsets. VTG are aware and party to various working groups trying to implement Gotcha to allow RU's and ECM's to manage their risks. VTG would welcome a practical implementation of Gotcha information and will support industry in this implementation, VTG cannot however, implement this alone as it has to be industry lead.

10. Following the most recent meeting of the Y25 group, the FTC sent OTT the notes of the meeting which included the following conclusion:

- *The checks introduced when wheelsets are removed for attention on Y25 and similar bogies should continue*
- *It would be appropriate for ECMs to review the maintenance and overhaul specifications applicable at General Repair of their Y25 and similar bogies in the light of the Working Group Findings*
- *The desirability and possibility of providing 'lock-up' markings will be kept under review dependent upon TOUAX experience with their trial*
- *The Working Group had effectively facilitated joint consideration of the issue and had come to conclusions based on shared information therefore no further meetings were considered necessary at this stage*
- *D. Barney would circulate draft meeting minutes and these would include a draft Bulleting for Working Group Member review and comment.*

Recommendation 2

The intent of this recommendation is to develop industry understanding of the potential wear mechanisms that can lead to suspension lock up, so that wagon maintenance regimes adequately manage the associated risks.

VTG Rail UK should liaise with other entities in charge of maintenance for freight wagons to review and, if appropriate, amend its inspection and maintenance regimes for wagons with Y25 type bogies to ensure that friction surface inspection and/or replacement frequencies are compatible with foreseeable wear rates. This review should include, but not be restricted to:

- understanding the mechanisms that lead to friction surface wear in Y25 bogie suspension;
- understanding the wear rates that are experienced in service; and
- understanding the limits of wear that can lead to suspension locking

This recommendation may also be applicable to other entities in charge of maintenance for freight wagons.

ORR decision

11. As with recommendation 1, ECMs operating in the UK worked together to develop a common understanding of the potential wear mechanism that can lead to suspension lock-up on Y25 bogies and what changes to inspection and maintenance regimes should be made as a result.

12. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, ECMs that maintain Y25 bogies are working together through the FTC working group have:

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

Status: Implemented.

Information in support of ORR decision

13. VTG wrote to ORR on 5 September 2016 outlining the actions they were taking to address the recommendation:

> *With regard to recommendation 2, VTG have implemented the above* [see recommendation 1] *to identify locked suspension and have disseminated our information through the Freight Technical Committee (FTC) and the Private Wagon Federation (PWF). Please note that a working group has been set up by the PWF and its findings will be reported into the FTC. VTG already understands the wear mechanisms with Y25 bogies and wear rates. VTG and the RAIB however, cannot conclude why this wagon created a very unusual ridged wear plate and we therefore intend to go no further with this investigation.*

Recommendation 3

The intent of this recommendation is to ensure that the derailment risk at Angerstein Junction is adequately controlled.

Network Rail should review and, if appropriate, alter the infrastructure configuration on the line between Angerstein Junction and Angerstein Wharf sidings to reduce its contribution to the derailment risk in the immediate vicinity of the 851A trap points. This review should include, but not be limited to, consideration of:

- the wagon types and loads normally using the line;
- the layout of the check rail;
- the speed and braking profiles of trains using the line;
- the locations and operation of signalling equipment; and
- the location of the trap points, or the provision of alternative risk mitigation measures

ORR decision

14. Network Rail held a workshop on 22 May 2017 to consider changes that could be made to the infrastructure at Angerstein junction to reduce the risk of a train derailing in future. The workshop was attended by representatives of relevant asset disaplines from across Network Rail along with GB Railfreight. ORR support the cross-discipline approach Network Rail took with the workshop and the involvement of a freight operator. The workshop considered both engineering and operational controls to reduce the risk of a future derailment and has identified three key mitigation measures and a possible further long-term mitigation.

15. The outcome of the meeting was a HAZID report, which ORR has reviewed and concluded Network Rail have in place operational controls to reduce the likelihood of derailment at the points, and that these operational controls have reduced vulnerability as they are interlocked into the signalling system. The purpose of these controls is to address the increase likelihood of flange climb at very low speed in vicinity of the points and reduce the consequences should a derailment occur.

16. Based on GBRF involvement with the HAZID and positive feedback from the Freight Technical Committee, the relevant FOCs are satisfied with the conclusions and resulting proposals, which appear proportionate to the risks involved. This solution is also achievable now, whereas any infrastructure solution is described as requiring significant work to develop that may ultimately not be successful. Network Rail have completed some of the actions identified, but have not yet provided ORR with a time-bound plan for implementation of the others.

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

- taken the recommendation into consideration; and
- is taking action to implement it, but ORR has yet to be provided with a timebound plan for all of the agreed actions.

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

Information in support of ORR decision

18. On 1 February 2017 Network Rail provided the following initial response:

Network Rail will hold a cross function meeting during Spring 2017, which will be led by the DRAM; the risk assessment of the crossing being the main emphasis of the meeting.

Additionally the group will review and examine the moving of the signal, in conjunction with the possibility of closing the level crossing. Network Rail's Commercial Scheme Sponsor will attend to discuss this.

Consideration will also to be given to the issues surrounding the access point for RRV.

Any resultant actions from the meeting will be agreed and action plans and timescales will be confirmed.

19. The output from the workshop on 22 May 2017 was a HAZID report which identified the following risk reduction and mitigation:

Risk reduction and mitigation

The layout of the check rail on the approach to Angerstein Junction was discussed. It is continuous on the curve approaching Angerstein Junction, save for the portion of line though the trap points L851A in advance of signal L425.

At present, there exists no type-approved check rail for Network Rail use through switches and crossings. London Underground have a design, however it would require significant redesign and strengthening to cope with the type of trains running on Network Rail infrastructure. The feasibility of installing such a device was therefore discounted.

The question of replacing trap points L851A with a de-railer worked in conjunction with signal L425 was discussed, but was not deemed to be practicable.

The question of replacing trap points L851A with a TPWS Train Stop sensor was discussed, but not found to be practicable, as it would neither provide protection against propelled movements passing signal L425 at danger without authority, nor against Rail Mounted Vehicles or Plant doing likewise when placed on the branch via the adjacent vehicular access point. It was felt that it would be highly undesirable to lose this facility at this location, due to access constraints at other locations nearby. Such an alteration to the infrastructure would not be approved by the RSSB.

Relocation of the trap points and signal L425 further back from the junction was discounted, due to the presence of a public foot crossing. The costs associated with its closure or diversion are unlikely to pass any CBA due to the nature and frequency of traffic over the branch.

In the longer term, reopening the long-removed North to West curve towards Blackheath might be an option.

A causal factor in the three derailments which have occurred at this location, was that the train had been starting away from a stand at the next signal (L429), with the tenth wagon in the train standing over trap points L851A.

Since the last incident in 2015, Network Rail has mandated a Special Box Instruction (SBI) at London Bridge ASC, whereby the signaller may not clear signal L425 for a train the leave the Angerstein Wharf branch, without the next

signal, L429 also displaying a proceed aspect ('double–blocking'). This mitigates against trains being required to restart with wagons standing over trap points L851A, where there is no check rail. This method of working has been built into the interlocking at London Bridge ASC.

Further to this, the signaller is prohibited from signalling a train past signal L430 on the Up North Kent line, when a train is departing the Angerstein Wharf branch. The purpose of this is to mitigate against a train on the opposite line being subjected to any remaining derailment risk. A review will be conducted to determine whether it remains necessary to maintain this method of working. (Action: NR Ops/TOCs/FOCs).

The panel discussed the implications of degraded working, whereby the signaller might require the Driver to pass signals L425 and L429 at Danger. This situation negates the benefits of the mitigation outlined above; consequently, Network Rail will devise an additional SBI for London Bridge ASC, which will permit the signaller to authorise Drivers to pass both signals at danger simultaneously, at this specific location only. The panel felt that this measure would maintain mitigation against derailment risk on trap points L851A. (Action: NR Ops).

Since the last incident in 2015, an enhanced frequency inspection regime has been mandated at this location, and the requisite amendments to ensure this put into place in the Ellipse system. The threshold at which Maintenance intervention is required has been lowered, however, this remains to be formalised. (Action PJ). The infrastructure was confirmed to be fit for passage of the type of rolling stock in use, at the permitted line speed of 15mph. GB Railfreight will liaise with the relevant wagon leasing company re maintenance standards.

Conclusions

The panel considered the RAIB recommendations in respect of infrastructure and operations, and judged that Network Rail had put in place reasonable measures to mitigate against a similar derailment occurring in the future at this location. The actions described in Section 4.2 above will be put into place.

Annex B: summary of end implementer correspondence

20. On 26 August 2016, Colas wrote to ORR outlining the actions they were taking to address both recommendation 1 and 2:

> *Thank you for your letter regarding the Rail Accident Investigation Board (RAIB) report on the freight train derailment at Angerstein Junction including the report recommendations published on 1st June, 2016. To address the report recommendations 1 and 2 and to provide the assurance that Colas Rail takes the risk of derailments seriously, I have liaised with members of the Colas Rail Services freight engineering team to both discuss and arrive at suitable mitigation measures that meet the report's recommendations in terms of proposed measures to be taken to satisfy the report's findings.*
>
> *Colas Rail Services operates both on track machines and freight locomotives and wagons as stated in the Colas Rail ORR ROGS Certificates. The number of rail vehicles operated by Colas Rail are detailed on Rail Services form T04-9091 which includes each rail vehicle description, Entity in Charge of Maintenance (ECM), Keeper and Owner.*
>
> *Both Colas Rail and other railway undertakings, as part of an on-going industry initiative, would welcome the opportunity to undertake surveillance of the vehicles it operates by undertaking condition monitoring using the GOTCHA wheel impact load detection system. It is hoped that the system would provide information that could be forwarded to ECMs to check the condition of any suspect wagons and to take the appropriate remedial action. This option is still under discussion within the Cross Industry Freight Derailment Working Group and is mentioned here to demonstrate Colas Rail's willingness to share information within the wider freight fraternity.*
>
> *Within the Colas Rail Services freight engineering team, measures will be implemented that meet the requirements of recommendations 1 and 2 of the Angerstein Junction report including bogie frame twist measurements and checks on the wear profile of axle-box lateral wear plates with a pass or fail criteria on Y25 bogies. The engineering team will also consider/action the PCA findings in the Mott MacDonald report "Glouster Floating Axle Suspension" report "A review of maintenance practices and service performance" dated July 2016.*
>
> *Colas Rail Services undertakes freight operations whereby wagons are hauled that have an independent ECM and therefore do not fall within the remit of Colas Rail Services ECM arrangements, however, these external companies are compliant with the ECM Regulations. To address the matter of maintenance and surveillance of wagons that are maintained by external ECMs, a letter has been forwarded to all 5 external ECMs requesting a response from each of the 5 companies on their proposals to implement the RAIB report recommendations. The responses from all 5 companies will be reviewed by the freight engineering team for compliance to the report recommendations. I have attached a copy of the letter that has been forwarded to the external ECMs for information purposes only where Colas*

Rail Services have requested information on how each individual ECM intends to comply with the report recommendations.

21. The letter for Colas to other ECMs states:

I would like to bring to your attention the recent Railway Accident Investigation Branch (RAIB) report in to the Angerstein Junction Derailment of the 3rd June 2015, which was published on the 1st June 2016. The vehicle concerned had Y25 bogies and our records show that certain vehicles in your fleet operated by Colas Rail Ltd have either this type of bogie or a derivative.

Colas Rail Ltd is concerned from the content of the report that there is the potential that the maintenance and overhaul processes of Y25 bogies may not have been sufficiently robust to identify the defects that caused the derailment, and is seeking assurance from vehicle Entities in Charge of Maintenance (ECM) that the derailment risk currently is being managed by ECM processes.

<u>Angerstein Junction</u>

The immediate cause of the derailment at Angerstein Junction was insufficient load on the wagons' front right leading wheel that lead to flange climbing. The wagon had significant unloading of its leading right hand wheel caused by a combination of: -

1. *The suspension of the leading right hand wheel was locked in the loaded position due to a step (or recess) worn into the profile of the axlebox lateral wear plate. This change of profile meant that the damper entered the 1mm deep recess when the vehicle was in a laden condition and was then unable to slide out of the recess onto the less worn surface that it would normally contact when the wagon was unloaded.*
2. *The bogie frame had a 16mm frame twist, acting to unload the leading right hand wheel.*

The maintenance specification of the wagon neither identified the presence of, nor prevented the development of, a bogie twist and the suspension defect that caused the uneven loading. The specification for the lateral wear plates only gave a minimum thickness rather than a surface flatness.

<u>Management of Derailment Risk</u>

As part of the on-going industry initiative Colas Rail Ltd. and other railway undertakings would like to undertake surveillance of the vehicles it operates by undertaking condition monitoring using the GOTCHA Wheel Impact Load Detection system. It is hoped the system would provide information that could be forwarded to ECMs to check the condition of suspect wagons and take appropriate remedial action. However how such a system can be implemented is still the subject of on-going discussion within the Cross Industry Freight Derailment Working Group.

In the meantime Colas Rail Ltd needs to seek reassurance from the ECMs of the vehicles with Y25 bogies that:-

1. *Bogie frame twist measurements have been carried out at the vehicles most recent General Repair and/or incorporated into future overhaul specifications.*
2. *Maintenance Plans incorporate checks of the wear profile of axlebox lateral wear plates (i.e. to include the surface flatness or hollow wear) with pass/fail criteria, that can be carried out at wheelset changes or if suspension lock-up is suspected.*

Colas Rail would also be grateful for any instructions or advice that can be passed onto operational and maintenance staff to check or identify suspension lock-ups during maintenance or train preparation. Examples could be spring length comparison checks, visual indicators, where to look for damage etc.

Therefore Colas Rail Ltd requires a written response by either letter or email to giving the details of existing or proposed measures (with implementation time scale) to manage the derailment risks.

22. Davis Wagon Services wrote to ORR on 31 August 2016 indicating their willingness to take part in the review of Y25 bogie maintenance, although they are not currently an ECM for such bogies:

As you may be aware historically we have looked after "Y" series friction damped equipment from an ECM perspective and hence have knowledge of establishing maintenance and monitoring maintenance regimes for such equipment.

As we discussed Davis Wagon Services (DWS) were at one time an ECM for wagons fitted with "Y" series bogies with friction-damped suspension.

However DWS are now not ECM for wagons fitted with this type of friction damped suspension and with respect to Article 4 (& requirements of Annex 1) of Regulation 445/2011 DWS generally only undertake the following functions for other ECM's on such "Y" series bogies / equipment;

"d" – Maintenance Delivery

"c" – Management of maintenance (in some instances)

We would of course wish to be involved with any review etc.

23. DRS wrote to ORR on 27 October 2016 outlining the actions they were taking to address recommendations 1 and 2:

Recommendation 1

Direct Rail Services are the Entity In Charge of Maintenance (ECM) for a number of vehicles fitted with Y25 bogies and therefore the recommendation is deemed applicable.

Direct Rail Services will review all Maintenance Plans for vehicles fitted with Y25 bogies for the suitability and periodicity of the tasks associated with the suspension issues stated in the report. The jobs contained in the maintenance plan will be reviewed to ensure that adequate checks are carried out to identify wear patterns in the suspension friction surfaces and any abnormalities are handled appropriately for investigation and replacement when deemed necessary. There are prescriptive and descriptive tasks relating to the suspension and associated components which are carried out at defined periods and to date DRS have not experienced any issues described in the report. Direct Rail Services use Safety Performance Monitoring data and industry guidance by attendance at the Cross Industry Freight Derailment Working Group for composing maintenance plans along with service experience in operating the vehicles.

Direct Rail Services intend to respond with an update in an agreed timeframe.

This action is being addressed by the Direct Rail Services Technical Team to ensure all of the maintenance plans for vehicles fitted with Y25 bogies have sufficient checks and timely periods to aid in identification of potential signs of suspension lock up in the mechanism described in this report.

Recommendation 2

Direct Rail Services are the Entity In Charge of Maintenance (ECM) for the Nuclear Flask Wagons type FNA (FBT6) which are fitted with Y25 bogies and therefore the recommendation is deemed applicable.

Direct Rail Services are active members of the Freight Technical Committee and a Member / Corresponding Member of the Y25 working group set up as a sub-group where issues such as those noted in the report are discussed so that a transfer of knowledge can transpire between all parties. Any learning experience and recommendations that emerge from these groups will be implemented where/if necessary in the applicable Maintenance Plan.

24. Freightliner wrote to ORR on 11 October 2016 outlining the actions they were taking to address the recommendations:

Recommendation 1

Freightliner as an Entity in Charge of Maintenance (ECM) for a number of wagon types equipped with Y25 bogies and similar friction damped suspensions undertakes continuous review of service experience and have developed robust maintenance plans for these fleets which we consider to be equivalent or in excess of general industry practice.

As a result of this report Freightliner has undertaken a comprehensive review of its maintenance plans for vehicles equipped with Y25 bogies and made a number of further improvements as follows:

1) The inspection criteria for suspension damping components have been improved by providing further detail on the areas to be examined.

2) Specific instructions have been added to maintenance plans with respect to checking for wear steps and hollow wear on axle box and bogie wear liners. Specific acceptance measurements have been included for these wear mechanisms to ensure that components are removed from service before reaching the levels that were identified on the vehicle involved in the incident at Angerstein. The acceptable level of wear has initially been set at a low level to allow us to increase our knowledge of wear rates.
3) A new mandatory requirement has been added to undertake the above inspections at wheelset change with a backstop of every second annual VIBT. This additional inspection is intended to ensure that wear is identified and rectified before it can reach levels that could result in suspension lock up. This change is to be implemented across all friction damped suspension fleets with effect from the end of October.
4) Freightliner is undertaking a trial to assess the effectiveness of a painted mark on the bogie wheelset retention T-piece to assist staff in identifying a locked suspension. Subject to its success, this will be considered for future application to the fleet.
5) Freightliner continues to actively participate in the RSSB led Cross Industry Freight train Derailment Working Group and the Freight Technical Committee GOTCHA Working Group. These groups continue to explore the further application of GOTCHA to potentially identify wagon defects in service. This progress of this initiative is of significant interest to Freightliner as a potential significant tool in identifying defects more effectively.
6) Whilst not directly associated with suspension lock up, Freightliner has implemented mandatory bogie frame twist measurement at General Repair. Freightliner's FEA wagon fleet (600 wagons) is currently undergoing General Repair and are subject to this inspection.

It should also be noted that Freightliner has identified that the recommendations highlighted by this incident are also applicable to other types of friction damped suspensions that we are responsible for namely Gloucester Pedestal Suspension, Y33 and FBT6 Bogies. For wagons equipped with Gloucester Pedestal Suspension, Freightliner has previously mandated full inspection of the friction damping components at wheelset change and annual VIBT. This inspection already included checks for wear steps etc and will continue.

The inspections detailed above have been applied to all fleets equipped with friction damped suspension.

Recommendation 2

As a result of the above recommendation VTG convened a working group via the Freight Technical Committee and the Private Wagon Federation to review maintenance procedures for Y25 bogies employed by the industry. Freightliner is a member of this group and has actively contributed information to the group at the first meeting held in late September. Freightliner will continue to contribute to the group and will consider any additional information

that may be identified by the group for further enhancement of our maintenance procedures.

I am therefore satisfied that the actions taken by Freightliner as following the publication of this report have further strengthened our maintenance policy in this area.

25. NACCO wrote to ORR on 19 August 2016 outlining the actions they were taking to address the recommendations:

Recommendation 1

Nacco have agreed with a number of ECM's to share information on Y25 wear that may lead to suspension lockup to increase sample size and to assist in establishing if there are there are any apparent differences between wagon fleets

- *Understanding the prevalence of such wear to these friction surfaces;*

  Nacco has not historically encountered the wear pattern documented in the report but will reevaluate when a wider sample of Y25 wear plates have been examined.

- *Amending inspection processes to allow identification of uneven wear patterns on friction surfaces;*

  Nacco have issued instructions to inspect the Y25 wear plates with the intention of understanding if there are uneven wear issues on our fleet. Once we have gathered this data Nacco intends to work with a wider industry working group to pool information, to develop an appropriate inspection instruction and to establish limits for wear patterns on friction surfaces. Nacco attends and contributes to the current Gloucester pedestal suspension working group which is also involved in the evaluation of friction suspension issues and the development of improved maintenance practice.

- *Consideration of methods, such as measurements or physical markers, to allow identification of suspension lock up problems; and*

  Nacco are considering the use of physical markers to assist in the identification of suspension lock up by operational and maintenance staff and intend to evaluate if this is actually a practicable possibility as part of the scope of the working group.

- *Consideration of the use of wheel weight data sources, such as Gotcha, to identify wagon defects that can increase derailment risk (paragraphs 105a and 105b).*

  Nacco through our membership of the Private Wagon Federation and the Freight Technical Committee is aware of the work being undertaken by the Cross Industry Freight Train Derailment Working Group in this area and

intend to fully support the development of Gotcha as a tool to assist in identifying uneven wheel loads.

Recommendation 2

Nacco have issued instructions which require the maintainer to collect uneven wear data from the Y25 friction suspension system. The instruction requires the automatic rejection of plates which have uneven wear which has caused a 1mm ridge. All uneven wear will be reported to the Nacco Engineering Manager for evaluation prior to the component being refitted to the vehicle. If uneven wear is identified the suspension system will be investigated to identify the probable cause.

- *Understanding the wear rates that are experienced in service; and*

Through the inspection process uneven wear rates will be evaluated against time in service and the mileage from the last inspection.

- *Understanding the limits of wear that can lead to suspension locking (paragraph 105b).*

All Nacco vehicles equipped with Y25 bogies are subject to General Repair (7 year periodicity) where the bogies undergo the full overhaul of the suspension system and a frame twist inspection. The bogie will be subject to a further frame twist inspection if the vehicle is involved in a derailment, this mitigates the potential of derailment risk due to bogie frame twist.

As explained in this letter Nacco will actively work with the industry to improve the understanding of the wear limits to avoid the potential of suspension locking.

I believe that Nacco has considered the RAIB recommendations and taken the appropriate action to implement them. The period of evaluation and data gathering required is planned to be completed by the end of 2016. It is intended that the knowledge gained will then be taken forward by a cross industry working group with the objective of establishing best practice in maintaining these friction suspension systems.

26. Network Rail wrote to ORR on 1 February 2017 outlining the actions they were taking to address the recommendations:

Recommendation 1

As a member of the Freight Technical Committee (FTC) we will work collaboratively with our industry partners to determine the actions required to address the risk of friction surface wear rates and inspection/maintenance requirements. This will consider the potential for monitoring wear and use of markers or indicators to identify uneven wear. FTC has formed a working group to review and propose the actions to close the recommendations.

We have taken the decision to incorporate recommendations into a single Component Maintenance and Overhaul Instruction rather than review and update multiple documents. This document will then be reviewed and rolled out to all Y25 fitted vehicles. Timescale: 30 June 2017

Recommendation 2

As a member of the Freight Technical Committee (FTC) we will work collaboratively with our industry partners to determine the actions required to address the risk of friction surface wear rates and inspection/maintenance requirements. FTC has formed a working group to review and propose the actions to close the recommendations.

We have taken the decision to incorporate recommendations into a single Component Maintenance and Overhaul Instruction rather than review and update multiple documents. This document will then be reviewed and rolled out to all Y25 fitted vehicles. Timescale: 30 June 2017

27. Plasmor wrote to ORR on 21 September 2016 outlining the actions they were taking to address both recommendation 1 and 2:

(a) The Plasmor fleet of wagons consists of 81 x 2-axle 46t GLW flatbed wagons fitted with parabolic suspension springs. Since parabolic spring suspension does not act in the same way as Y25 bogie suspension, we consider that there is no risk of lock up. As such, recommendations 1 and 2 of RAIB Report 10/2016 are not relevant.

(b) Considering (a) above, no measures are required since recommendations 1 and 2 are not relevant to the Plasmor fleet of wagons.

(c) For the reason explained in (a) above, no measures are necessary for Plasmor to implement any of the recommendations made in report 10/2016.

28. Railcare wrote to ORR on 13 September 2016 outlining the actions they were taking to address both recommendation 1 and 2:

The Railcare fleet of wagons currently operational in the UK consists of 5 x 90t GLW flatbed wagons that permanently convey RailVac machines. The wagons are fitted with Y25 bogies; as such, they do fall within the scope of RAIB Report 1012016 as indicated in your correspondence.

Upon receipt of RAIB Report 1012016 following its publication in June of this year, Railcare commenced a programme to test for any evidence of suspension lock-up by means of jacking as depicted in Figure 9 on page22 of Report 1012016. Since commencement, this jacking test has been performed on a monthly basis and it is our intention to continue such testing for the time being until the mechanism of suspension lock-up is thoroughly understood.

Railcare supports by attending convened meetings of the PWF Y25 Bogie Working Group that was formed to share knowledge and gain a greater understanding into bogie suspension lock-up / derailment mechanism on Y25

and similar bogie designs. It is envisaged that the work of this group will be concluded by the end of 2016.

As an aside, we further advise that twist checks of our Y25 bogies form part of their 6-yearly overhaul programme.

We shall be able to formalise any permanent amendments to our bogie maintenance regime once the PWF Bogie Working Group has concluded its work. In the interim, we consider that the possibility of bogie suspension lock-up is being effectively managed by our implementation of the above control measures.

Railcare sent the following update on 25 April 2017:

1. *Railcare have supported, attended and contributed to the meetings of the PWF Bogie Working Group*
2. *Railcare are supportive of the outcome of the PWF Bogie Working Group*
3. *PWF intend to forward a copy of the minutes of the final meeting the PWF Bogie Working Group to Paul Frary and to also table the minutes at the next FTC meeting*
4. *The recommendations resulting from the PWF Bogie Working Group are already included in, or have subsequently been added to, the maintenance regime for the bogies fitted to the Railcare wagons operating in the UK*

29. South West Trains wrote to ORR on 15 November 2016 outlining the actions they were taking to address both recommendation 1 and 2:

Thank you for your letter of 13/09/16. SWT has reviewed the recommendations in the RAIB report and has taken a number of steps to address the issues raised, and also has some existing mitigations in place. Measures taken by SWT to implement the recommendations and current mitigation:

1 All of our KHA wagon wheel sets were given a full overhaul by CAF in 2015. This included inspection of wear plates on axleboxes (see photo of our overhauled wheelset axle box wear plates compared to that of another operators wheelset). While there is some evidence of wear (a ghosting mark on the wear plate),the surface is flat.

2 Our current wagon VMI has job Q 03.3- Axlebox guide wear plates examine, this is completed whenever the wheelsets are removed, as the report mentions it is not possible to inspect them properly with the wheelsets fitted. Wheelsets are removed as required.

3 All spare wheel sets currently stored at Eastleigh have been inspected and found to be acceptable. Wagons 99709319001-2 and 99709319002-0 currently have their wheel sets removed for other work to take place and are having have their wear plates inspected.

4 Following liaison with other operators, we understand that the average freight wagon covers well over 80,000 miles per year; the SWT wagons are only used between March and September for short transits. This year the wagons being used for testing and trials clocked up only 1,475 miles. This is less than 2% of the annual average mileage of other operators.

5 SWT is using Rail Bam to mitigate the risks associated with suspension lock up. Use of this system will allow us to establish if any of our 4 wagons have locked suspension and then allow us to monitor the wagons as they are used, to identify a worn out wear plate before it becomes an issue. No issues have been identified on the current fleet.

30. STVA wrote to ORR on 28 October 2016 outlining the actions they were taking to address both recommendation 1 and 2:

STVA do not own any wagons fitted with Y25 bogies but do lease some vehicles fitted with Y33 bogies which are similar in concept. STVA are therefore participating in the PWF Working Group that has been set up to investigate the matter further with a view to making appropriate recommendations.

31. Touax Rail wrote to ORR on 19 September 2016 outlining the actions they were taking to address both recommendation 1 and 2:

With regards to the letter sent by the ORR regarding the above incident and the recommendations of the report produced by the RAIB.

- *Touax Rail are involved in the UK industry working group which has been set up within the PWF to determine the potential actions which could be best implemented to address the recommendations 1 and 2 of the RAIB report.*

- *Touax Rail will review the proposed recommendations from this working group and where appropriate implement the actions for the Touax Fleets which may be affected.*

- *The timescales to action the proposed recommendations will depend on the time taken by the PWF working group, but as the Chairman of the working group I have already suggested placing a timescale for completion of the work by the end of the year (2016) which has been generally accepted within the working group.*

32. Volker Rail wrote to David Bestwick (ORR) on 12 September 2016 outlining the actions they were taking to address both recommendation 1 and 2:

Having reviewed the RAIB report into the accident at Angerstein Junction 3rd June 2015, and the recommendations included, we VolkerRail have procedures in place that satisfy the duties of an ECM, which includes but is not limited to the competence of our staff, their technical ability and the periodicy of the checks. As discussed at our meeting the suspension and loadings of our fleet of Kirow support vehicles (for which we are ECM), rarely differ, but do form part of our internal procedures.

33. Wabtec wrote to ORR on 7 September 2016 outlining the actions they were taking to address both recommendation 1 and 2:

> *<u>Proposals</u>*
> *i) Currently there is only one contract where WRL acts as ECM for Tarmac 110 x PHA & 4 x KJA Wagons forming SDT fleet. This contract is currently paused as the vehicles are quarantined pending a decision from the owner as to their future. Therefore there is no intention to carry out any immediate review or measures based upon this report.*
>
> *If the decision is made to bring these vehicles back into service there will be full review of the maintenance activities prior to coming back into service. The measures / recommendations from this report would form part of that review and would be shared with the ORR as part of the process.*
>
> *ii) WRL has contacted VTG and GBR to how WRL can support in the development and implementation of their changes based upon this report.*