



**HMRI's Risk Profile Topic Strategy for Rolling Stock**

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## Introduction

This document summarises HMRI policy and strategy for securing the control of rolling stock health and safety risks on the railway networks and tram systems of Great Britain.

The strategy addresses rolling stock risks, emerging topics and legislative changes such as European directives. For the purpose of this strategy rolling stock is defined as any carriage, wagon or other vehicle used on track and includes a locomotive<sup>1</sup>. Six broad groups have been used; National network passenger & freight; London Underground; Metro Systems; Minor & Light Railways; Trams; and On Track Plant. The strategy is one of a number of topic areas that have been treated in a similar way. The full context is described in the introductory document<sup>2</sup>.

Rolling stock contribution to catastrophic risk on the railway is relatively low. Investigations of incidents, which have occurred rarely, identify the rolling stock asset as a causal factor. However rolling stock asset issues play a crucial role in mitigating the consequences of incidents caused by other factors, e.g., derailment through points movement (Potters Bar) defective rails (Hatfield) and operational error (Ladbroke Grove). Overall the risks are well managed but there remain opportunities for continuous improvement.

A core principle in health and safety law is for risk to be reduced so far as reasonably practicable, but not necessarily be eliminated. Any improvements in health and safety risk control must be seen in the context of financial and business risk. As technology, legislation and social perception of risk evolves, rolling stock designers and maintainers will always be challenged to justify their actions and inactions.

It should be noted that some issues relating to rolling stock interfaces with other systems such as signalling, track and operations are being developed under other HMRI strategies, which should be read in conjunction with this document.

## Summary Of Current Position<sup>3</sup>

On the main line railway there were no passenger or workforce fatalities resulting from train accidents during 2005 i.e. those incidents in which the rolling stock was identified as the primary causal agent. Over many decades the number of train accidents resulting in fatalities to passengers and railway

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<sup>1</sup> Railways Act 1993 section 83(1)

<sup>2</sup> [Topic Strategy Introductory Document](#).

<sup>3</sup> Contact the author for further details and background

employees has steadily reduced to the current average rate, based upon data for the last ten years, of less than one per year<sup>4</sup>.

The evolution of safety management is believed to have been a significant factor in bringing about these improvements but the public perception on railway safety performance is still popularly judged by infrequent but multi-fatality train accidents.

RSSB's Safety Risk Model (SRM) identifies that risks arising from rolling stock causes accounts, on average, for around 6% of the total network system risk. Also worth noting are the figures from RSSB's Precursor Indicator Model (PIM), that indicates the impact on risk of the fluctuations in the occurrence of incidents that make up the precursors to train accidents. Rolling stock defects contribute only 5% of the 2005 PIM and have remained steady over the last twelve months.

RSSB's SRM and Annual Safety Performance Report focus upon the main line risks, whilst other parts of UK railway have other models to help assess and manage risks. For instance, London Underground has its own predictive model methods for managing top risk events. As with the SRM, LUL models suggest that the contribution from rolling stock defects to overall event risk are relatively low compared with other aspects of LUL operation.

Sources of information for understanding rolling stock risks within other parts of the industry include data obtained under mandatory reporting regulations, industry reports and investigations, and reports produced by the Rail Accident Investigation Branch (RAIB). Dutyholder and other Stakeholder documentation, including research reports, are further sources.

## **Policy and Strategy**

### **ORR Corporate Strategy<sup>5</sup>**

ORR has a long-term vision for the main-line railway industry, which includes infrastructure controllers, operators, suppliers and funders working together to deliver a safe, high performing and efficient railway.

ORR also recognise our safety regulator responsibilities across the UK railway industry including London Underground, metros and heritage railways. which we will discharge consistently with the vision for the mainline

Over the 2006-2009 period ORR's focus will be on:

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<sup>4</sup> Railway Safety and Standards Board (RSSB) Annual Safety Performance Report 2005

<sup>5</sup> 'ORR Corporate Strategy:2006-09 and Business Plan 2006-07.

- securing continuous and sustained improvement in safety, performance and customer service;
- pursuing relentless improvement in the industry's efficiency and value for money, and;
- through these and other actions, enabling the railway to grow and develop to meet the requirements of funders and aspirations of stakeholders.

In relation to health and safety performance for Great Britain railways the ORR's general approach is to:

- monitor and enforce compliance with health and safety law;
- encourage and promote the achievement of continuous improvement in health and safety by the rail industry through good management, improved processes and renewal of equipment;
- encourage and facilitate more efficient ways of delivering this continuous improvement;
- facilitate an informed debate about options to address risks which are of concern to society, but where there is currently no legal requirement, and
- engage effectively with the full range of stakeholders on health and safety issues.

### **HMRI's core purpose:**

Within the new combined economic and safety regulator, HMRI's core purpose is to secure the proper control by dutyholders of risks to the safety and health of passengers, employees and others who might be affected by the operation of Britain's railways.

### **HMRI's Strategy**

The key strategic themes carried forward into ORR from HSE include<sup>6</sup>;

- Developing closer partnerships (working through others); and
- Helping people to benefit from effective health and safety management and a sensible health and a safety culture (understanding the benefits

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<sup>6</sup> Health and Safety Executive HM Railway Inspectorate Operating Plan 2005/2006 April 2005

of health and safety; involving the workforce; providing accessible advice and support).

## **The Strategy for Rolling Stock**

- Publishing a clear statement of expectations for rolling stock risk management on Britain's railways over the next decade, consistent with ORR policies, in consultation with dutyholders and stakeholders, and in line with existing and developing legislation, and best practice;
- Engagement with dutyholders and stakeholders to develop and clarify requirements in relation to existing and future rolling stock developments and their safety implications;
- Ensure that appropriate standards are in place and applied for rolling stock design and maintenance based upon statutory requirements, best practice, information and intelligence;
- Continue to work with the industry and other stakeholders to ensure that rolling stock risks are reduced so far as is reasonably practicable;
- Develop robust systems within the Inspectorate to move from historical data collection and information based planning to real time intelligence and knowledge based Delivery Plans;
- Secure the appropriate resources to engage effectively with the industry in technical debates;
- Be fully involved (and engaged) in national and international debates on rolling stock policy and future developments;
- Ensure that dutyholders have effective management and operational systems and procedures in place to control risk;
- Ensure recommendations relating to the management of relevant risks from RAIB, HMRI and industry investigations are satisfactorily addressed; and
- Promote transparency and consistency in line with HMRI's operational and safety policies.

## **Delivering the strategy**

### **The Work Streams**

The following work streams are identified as broad groups of activities that will be further scoped into work activities to be undertaken over the lifetime of this strategy. The work activities will comprise those core to future delivery plans and others relating to policy, procedural and planning needs.

## Generic Railway Rolling Stock work streams

- Making positive and informed decisions on attendance at NR, FOC/TOC, LUL, Minor Railways, RSSB, RAIB and other railway and industry meetings, forums and conferences to ensure that HMRI are fully aware of the current and future developments so the appropriate actions can be considered and taken;
- Identifying our information needs, and promote recording, verification, analysis and process which allow stakeholders within ORR to take timely and informed decisions;
- Ensuring that Delivery Plan activities are undertaken in a timely manner to an agreed standard, with clear identified outputs. The outputs will be used to influence future delivery plans and HMRI investigation policy while adding value to dutyholders and stakeholders and the industry at large;
- Monitoring the quality of investigations and reports undertaken by the industry and the appropriateness of recommendations their timescales and completion to close out;
- Analysis of the effectiveness of the safety legislation regime in ensuring that rolling stock risks are efficiently reduced so far as is reasonably practicable, and seeking review and amendment in accordance with the findings;
- Engagement with dutyholders and stakeholders to clarify requirements and expectations in relation to rolling stock safety and statutory consultation, and securing commitment to those arrangements;
- Engagement with dutyholders and stakeholders to clarify requirements and expectations in relation to the requirements within the TSI's and any future rolling stock implications from adoption of ERTMS within Great Britain;
- Investigation of rolling stock incidents and complaints, to determine root causes of and gather intelligence for securing continued improvement;
- Inspection of dutyholders' and stakeholders' safety management systems for ensuring rolling stock assets remain safe in all modes of operation;
- Inspection of rolling stock systems and subsystems to ensure that adequate maintenance procedures are in place and in operation;
- Taking enforcement action in accordance with the ORR Enforcement Policy Statement; and
- Promotion of research that contributes to the aims of the strategy; monitoring and contributing to rolling stock research programmes, and securing appropriate action to implement recommendations.

## Passenger and Freight (Specific) Workstreams

### *Couplers*

- HMRI to work with dutyholders and other stakeholders to establish a clear understanding of the risk of coupler/coupler system malfunctions; and
- In conjunction with dutyholders and other stakeholders, establish a clear understanding of the root causes of unsolicited train divisions that emanate from coupler and coupler systems malfunctions and ensure appropriate action is taken.

### *Wheelsets system (includes wheels, axle boxes and axles)*

- HMRI to ensure that the industry has adequate systems and procedures in place for suitable and sufficient design and maintenance for the management of wheelsets.

### *Brakes*

- HMRI to continue to engage with dutyholders and stakeholders to ensure that adequate management systems and procedures are in place for the design and maintenance of brake and adhesion systems.

### *Crashworthiness*

- HMRI to continue to develop with dutyholders and other stakeholders an understanding of the crashworthiness and mode(s) of deformation of welded aluminium railway vehicle structures in order to achieve a common understanding of the risks.

### *Emergency evacuation*

- Review the industry standards that have evolved since Ladbroke Grove and other major incidents, understand the implication of European standards, and design and implement a suitable inspection regime to ensure statutory compliance.

### *Fires*

- Review information and rolling stock data on emerging or poorly understood risks to determine whether established fire systems continue to operate in adverse conditions; and
- Gain a better understanding of the main causes of train fires and establish whether a targeted inspection programme could bring about an improvement by encouraging the industry to address these root causes.

### *Doors*

- Inspection of management systems and in particular the maintenance regime for the management of internal and external door design improvements and maintenance;

*Private owner wagons*

- Engagement with dutyholders and stakeholders to promote a debate on the industry's roles and responsibilities in relation to design and maintenance of UK and non-UK owned private owner wagons and effectively influence improvements in safety management.

**LUL (Specific) Workstreams**

- Review and verify LUL and Infracore statistical safety and maintenance models to establish a risk based Rolling Stock Delivery Plan; and
- Ensure that the current Rolling Stock Delivery Plan is implemented and any relevant findings are appropriately acted upon and considered for the subsequent planning years.

**Metro System (Specific) Workstreams (Glasgow and Tyne and Wear)**

- Devise programmes of work aimed at reducing the rolling stock risks. This will include a review and verification of the Metro statistical safety and maintenance models to establish a risk based Rolling Stock Delivery plan; and
- Ensure that the plan is implemented and any relevant findings are appropriately acted upon and considered for the subsequent planning years.

**Trams and Light Railways (Specific) Workstreams**

*Trams*

- Engage dutyholders and stakeholders to develop of industry standards for design of tram vehicles.

*Docklands Light Railway (DLR)*

- Review of rolling stock information data and assess the adequacy and robustness of the management systems and any relevant findings to be acted upon and included in the HMRI's planning process.

**Minor Railways (Specific) Workstreams (be aware that many of these are legally Light Railways)**

*Heritage*

- Devise a targeted programme of activities aimed at establishing the level of compliance with requirements for asbestos management in rail vehicles;
- Continue to develop with dutyholders and other stakeholders for a common Code of Practice for boiler management; and
- Review information and rolling stock data on emerging or poorly understood risks to determine whether the established fire systems continue to operate in adverse conditions.

### **On Track Plant**

- Establish a knowledge based inspection regime for On Track Plant and ensure that intelligence gathered is used to direct future inspection programmes.

### **Evaluation**

The evaluation of this strategy is difficult as so many factors need to be considered and to occur before a positive impact can be observed. However, the strategy endeavours to create an environment where the Regulator, dutyholders and stakeholders can work towards the common purpose of developing a safe and successful railway network.

By sharing common themes the strategy will be deemed to have added value if:-

- the risks to rolling stock continue to be considered low;
- improving trends continue and where possible improve (such as the average rate of equivalent fatalities per year and the zero fatality from train accidents)<sup>7</sup>;
- HMRI embraces targeted Delivery Plans that are consistent with and support statutory requirements whilst promoting best industry practice; and
- There is an effective, modern statutory consultation regime in place to reduce overall risk, based upon industry sector baseline for 2005.

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<sup>7</sup> Railway Safety and Standards Board (RSSB) Annual Safety Performance Report 2005