



## Monitoring & Review: Lifting the quality of risk control

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### Summary

Keeping Britain's growing railway amongst the safest in the world requires sustained focus to deliver excellence in risk management. Our enforcement activities find that risk controls are not always consistently or reliably achieved. Whilst easy to find evidence of failure to manage risk at a discrete location, it is less easy to demonstrate systematic failure in the management system underlying discrete failures; and take action to lift the quality of risk control across an organisation.

This paper sets out to examine this factor, the role of monitoring & review, and outlines one methodology adopted by Britain's railway national safety authority to support an infrastructure manager lift the quality of risk control across an organisation.

### Introduction

The Office of Rail and Road (ORR) is the independent economic and safety regulator for Britain's railway, and monitor of performance and efficiency on England's Strategic Road Network. We regulate health and safety standards and compliance across the whole rail industry. Our legal framework for safety is based around employers assessing and controlling risks so far as reasonably practicable.

The mainline railway infrastructure in the UK is owned and operated by a non-departmental public body – the infrastructure manager, accountable to its customers and funded through a mixture of access revenue paid by train operating companies, and central government grants. ORR sets the economic framework for the main line industry through a price control mechanism which sets what the infrastructure manager must deliver and the funding it requires to deliver this. Within the five year financial settlement, the infrastructure manager is explicitly funded to develop, operate, and maintain the network safely.

As the national safety authority, our health and safety regulatory strategy<sup>1</sup> sets out our approach to regulating health and safety risks created and managed by Britain's railways. It looks at how we drive continuous improvement to deliver a cost effective and safe railway that is amongst the safest in the world. Our strategy is supported by five of our six corporate strategic objectives<sup>2</sup>:

1. A safer railway
2. Better customer service
3. Value for money from the railway
4. Better highways
5. Promoting a dynamic and commercially sustainable rail sector
6. High performing regulator

To really make progress towards achieving a safer railway we believe the industry should become more proactive in recognising and managing safety issues before passenger or rail workers come to harm. The role of monitoring & review is key here; to provide confidence that risk control measures are well designed and effectively implemented; before the unsafe event occurs.

## Background

Britain's railways are currently the safest they have ever been, and keeping them amongst the safest in the world requires sustained focus and continued drive to deliver effective, efficient excellence in risk management. The on-going challenge of managing growth and change puts additional pressure on the industry, requiring continuous improvement in both the design and implementation of processes to manage risk efficiently. Our enforcement activities serve as a reminder that risk controls are not always consistently or reliably achieved and that we have to step in to ensure compliance with the law or to deal with an identified immediate risk.

ORR is working to make the rail industry more proactive in recognising and managing risk before passengers and rail workers come to harm.

It is easier through proactive regulatory site inspection, or if there has been an accident, to find evidence of failure to manage risk at a discrete location. We find many examples of inadequate compliance with company processes, rules and standards – indicating unreliable inconsistent risk control. It is less easy to demonstrate a systematic failure in the management system underlying this discrete failure; and to then take wide ranging action to lift the quality of risk control across the organisation and not just at the discrete location. In recognition of this challenge we developed the Rail Management Maturity Model (RM3) as a means of analysing strengths and weaknesses of whole management systems.

RM3 help's begin to address the wider question:

*Why does the regulatory authority, in this case ORR, identify basic non-compliance rather than the infrastructure manager's own internal assurance arrangements?*

## Regulatory approach

ORR has a number of tools within its regulatory framework to drive continuous improvement, including our corporate strategy; strategy for health and safety risks that informs our inspection and investigation activity; the rail management maturity model (RM3); and safety performance data. Using these tools helps us engage with the industry and target our effort as to where it will have most benefit.

Previous ORR regulatory intervention has concluded that the infrastructure manager's safety management system (SMS) was not delivering the best level of risk control in the most effective manner, due to an increasingly complex architecture of standards that did not clearly link risk and control. The infrastructure manager's response was to go back to first principles to analyse their risk management processes and how they communicate them using the bow tie methodology.

The bow tie model (figure 1) is a visual tool that increases the visibility of the link between risk (top event), threats (causes of the risk), consequences, and controls to prevent risk materialising and the mitigations for damage limitation once the risk has materialised. It can also be used to demonstrate the

effectiveness of the controls by considering the adequacy of the control and level of certainty that the control will function as intended when called upon.



Figure 1: Bow Tie Model (caa)

Using this approach, the infrastructure manager has begun improving the clarity of their risk control arrangements with explicit links to roles and responsibilities and their competency management system. This has also allowed the infrastructure manager to assess the reliability of their risk control arrangements, how reliant they are on human controls, and importance of assurance. This approach is most mature in the track maintenance discipline.

Their analysis indicated that a high proportion of track maintenance risk control measures have lower degrees of effectiveness, chiefly attributed to the high reliance on human judgement and activity. This increases the dependence on monitoring & review activity at the front line to provide confidence risk is controlled as intended. And unless the monitoring & review arrangements are assessing effectiveness proactively, the likelihood of bow tie analysis acting as the panacea to driving forwards improved risk control through increased clarity alone remained low.

So the bow tie analysis begins to demonstrate the criticality of effective monitoring & review arrangements in lifting the quality of risk control across a discipline and begin to answer the question posed above: why does it need the regulatory authority to identify basic non-compliance? The challenge for ORR was how to use this to help support the infrastructure manager deliver continuous improvement, across their organisation?

As the regulator, we needed a way within the regulatory framework to translate this theory into reality, to test and demonstrate the effectiveness of the infrastructure manager's monitoring and review activity; and identify where improvements were required.

#### Rail Management Maturity Model (RM3)

ORR developed RM3<sup>3</sup> in collaboration with the rail industry as a tool for assessing an organisation's ability to successfully manage health and safety risks, to help identify areas for improvement and provide a benchmark for year on year comparison.

RM3 describes what excellent management capability looks like for key elements of an organisation's health and safety management system. It allows organisations to assure themselves that their risk

management arrangements are operating to an adequate standard; and provides a route map to help them improve.

We use criteria set out in RM3 to understand an organisation's maturity in a number of key business critical areas and in assessing the effectiveness of their risk management systems. We collect evidence during inspections and investigations and compare this against descriptions of each level to make a judgement on the capability of a company's health and safety management arrangements. This allows us to make year on year comparisons on a company's performance, and identify particular areas of weakness or concern.

### Monitoring & review

A good safety culture is a key requirement in delivering effective management of risk; leadership is fundamental in setting the culture of the organisation. One important element of leadership is delivered through setting standards and ensuring those standards are met. At a more practical tactical level (or 'front line'), this latter activity aligns with the *monitoring & review* element of a company's health and safety management system.

The output of our RM3 assessment is shown below; the light blue shaded area showing the range of ratings for every criterion. The darker line shows our final assessment.

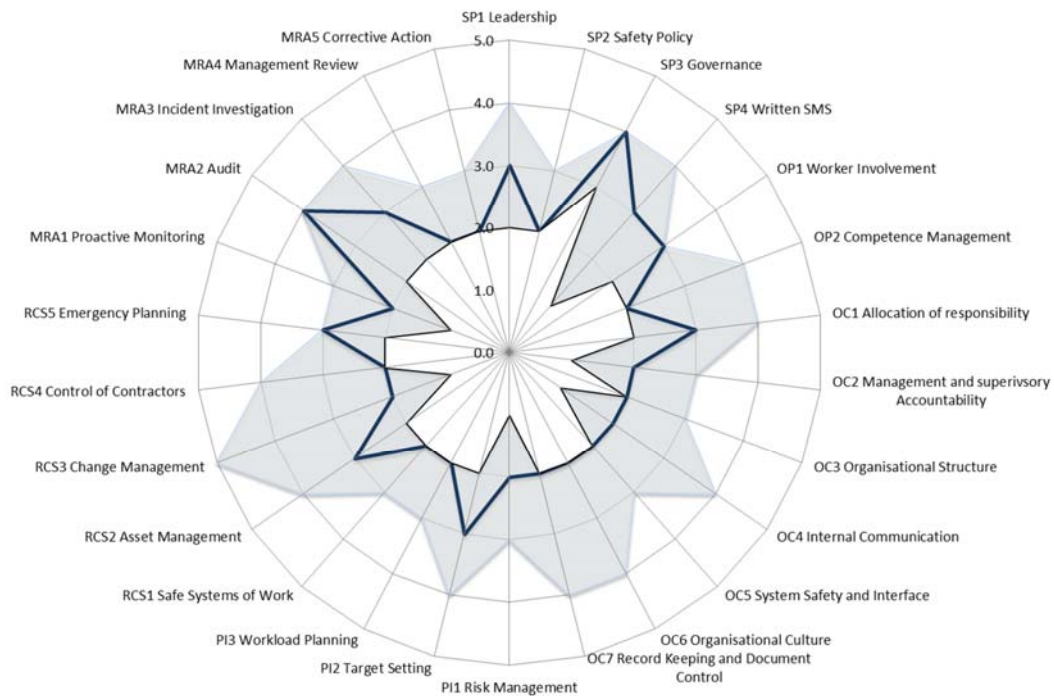


Figure 2: Infrastructure Manager RM3 evaluation 2015/16<sup>4</sup>

Two themes emerge from our RM3 evaluations:

1. senior safety leadership and written SMS is improving, but is not translating to implemented improvements on the front line; the 'doing' elements of the safety management system were not effective generally because they are vulnerable to external influence; and
2. that there is great variation in levels of management maturity across the network. This variability needs to be understood and addressed if the infrastructure manager's safety management system is to evolve and become more reliable and predictable at managing risk. Developing assurance capability, particularly the monitoring and review elements has the potential to begin to deliver improvements across the board. Whilst the IM understood the importance of proactive monitoring and built it into processes, actual delivery of assurance activity, particularly at a tactical level was inconsistently applied and in many cases lacking.

Within the UK regulatory framework, monitoring and review is captured by some railway specific legislation - The Railway and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup> (ROGs). Regulation 3(2) requires an infrastructure manager to establish and maintain a safety management system that meets the requirements of regulation 5(1), and in turn schedule 1 that sets out the basics of the safety management system. This requires the safety management system to have procedures to meet the relevant technical and operational standards, and have procedures to ensure compliance with those standards. These requirements are supplemented by the ROGs general duty to undertake risk assessment and specifically regulation 19(5) that requires the infrastructure manager to have arrangements for the effective planning, organisation, control, monitoring, and review of its risk control measures.

The infrastructure manager's safety management system states that monitoring of compliance is achieved through the first and second lines of defence arrangements, and that managers are responsible for monitoring health and safety performance, including compliance with standards and procedures.

The infrastructure manager's arrangements to confirm compliance with their own processes are defined in a company standard, supplemented by management and supervisory inspections. Their assurance framework defines three levels or 'lines of defence' of auditing and self-assurance arrangements. Level 1 assurance is described as 'local management controls' and includes local compliance monitoring, inspections, and self-assurance. Level 2 assurance provides corporate oversight of risk control through functional audits and engineering verification and is independent of the route. Level 3, the highest level, provides independent challenge through the infrastructure manager's corporate audit team and is informed by activities undertaken by external bodies such as ORR.

Our RM3 analysis illustrates a disconnect between a higher assessed level of leadership and an absence of implemented improvements on the front line. This suggests that amongst other things, the assurance framework was not operating as intended; particularly at levels 1 and 2. We concluded that a key area for focus was the effectiveness of the infrastructure manager's level 1 and 2 assurance arrangements, and how they made senior management aware of the quality of risk control. If the infrastructure manager strengthened its monitoring & review arrangements, and improved how it measured the quality and effectiveness of its performance measures, it could self-generate improvements to its own management of safety, performance, and business risk in a sustainable manner.

## Targeted Intervention

To drive this forwards we focused on one area of the railway operation – track. The track asset forms a key part of the transport system and has a direct impact on safety. The infrastructure manager has renewal, refurbishment, and maintenance arrangements in place to manage track deterioration risk. The effectiveness of safety critical maintenance is ultimately dependent on:

- The accuracy of asset information and in turn asset knowledge
- The adequacy of the judgements made by engineers, supervisors, and technicians;
- The quality of the work delivered on site
- The adequacy of the assurance arrangements, including front line assurance, inspection and monitoring.

Our aim was to deliver a structured approach to gathering a broad evidence base that could be used to challenge the effectiveness of the infrastructure manager's monitoring & review arrangements, with a view to national enforcement action if necessary.

Using a project based approach we focused on how reliably the infrastructure manager's standards, processes, and engineering judgement were at identifying and managing the risk created from discrete track faults. We developed a GB wide programme of targeted risk based track asset inspections focusing on the infrastructure manager's tactical management of risk; assessing the gap between requirement and delivery. As well as delivering risk improvement at a local level, the range of evidence gathered allowed us to carry out a wider overall capability assessment of the quality of risk control. This work was supported by inspection work focusing on the infrastructure manager's self-assurance processes, analyse of track geometry related investigation reports produced by the Rail Accident Investigation Branch, and review of the findings of the IM's own audit processes.

In each case we assessed whether the underlying deficiencies leading to the identified non compliances should have been addressed as part of a well-functioning tactical assurance process; and how our inspection findings correlated with the IM's higher level assurance activity, such as national audit and engineering verification findings. This allowed us to build up a body of evidence to support our opinion as to the adequacy of the assurance regime, as implemented, and link identified assurance deficiencies to real non-compliance.

## Results

We presented our findings and conclusions to the infrastructure manager, challenging them to better understand why their tactical assurance activity was unable to deliver sustained standards of risk control, and then take action to address the identified barriers. The infrastructure manager accepted the challenge. Through their own study they subsequently gained a better understanding of how well their monitoring and review framework is understood and applied by end users, with particular focus on front line 'tactical' element; and how this contributed to a loss in risk control effectiveness. Their study also found areas of good practice, such as positively noting that staff understood the importance of raising safety concerns, and were happy to raise them without fear of repercussion from their managers.

The infrastructure manager identified a number of national actions to improve monitoring and review effectiveness across their organisation that they are now delivering. These actions focus on improving

the design of their monitoring & review framework, how it is described and communicated, and the visibility of its outputs across the organisational hierarchy. They have embarked on developing an increasingly rounded suite of leading and lagging indicators that provide assurance around the quality of work undertaken, ensuring such indicators are more clearly linked to risk, be it safety, performance or business.

Supplementing this nationally led action, individual routes are taking their own actions, reflecting the particular needs of their own part of the wider organisation. This is promoting ownership at a more local level of both the barriers and their resolution, and should lead to better overall solutions that actually have impact.

We continue to monitor and review progress. One indicator of progress is the increasing visibility of infrastructure manager references to assurance; and how they can best assess the impact of change; compliance, and risk control effectiveness. However, where we have found unacceptable risk control leading to enforcement action, we consider making assurance part of enforcement action.

### **Conclusion**

Effective monitoring & review is as much about non-acceptance of sub-standard performance, behaviour and willingness to deliver as it is formal process. Cultural change is best achieved when the need for change is recognised; and the safety regulator can have a key role in fostering, encouraging and promoting that change.

RM3 allows us to assess and identify specific areas of weakness that are key enablers in to drive improvement in safety performance;

Delivering structured proactive project based inspections targeting one element of the safety management system, linked to specific health and safety legislation, can deliver a broad base of evidence to initiate improvements across an organisation;

Taken together this approach allows practical engagement to influence change with an infrastructure manager in areas that do not directly in itself lead to risk. The evidence base allows us to consider formal enforcement should appropriate response not be delivered.

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### **References**

- 1 ORR's health and safety regulatory strategy; February 2015
- 2 Office of Rail and Road Business Plan 2017 – 18
- 3 Rail Management Maturity Model RM3; ORR/HSL; updated 2017
- 4 ORR's Annual Health and Safety Report of Performance on Britain's Railways: 2015-16; July 2016
- 5 The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended)