Network Rail & Office of Rail Regulation

AO/022 Data assurance 2011-2012, Q3 Safety Risk

Report

218746-03

Issue | 21 February 2012

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Job number 218746-03

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Executive Summary

The 2011/12 Q3 audit covered safety with a requirement to review specific KPIs recorded within the Safety and Environment Assurance Report. Following last year's focus on the general Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) arrangements, the emphasis within the mandate for this review was on the following areas:

- RIDDOR Reporting by sub-contractors and labour only suppliers - last year's review looked at Principal Contractors only;
- Infrastructure Wrongside Failures - the process was under review at the time of the last audit and an audit of the revised arrangements was therefore mandated;
- Irregular Working – carry out a further review into how irregular working is identified and reported;
- Red Zone/Green Zone - review how Network Rail records the proportion of hours worked under both red and green zones for maintenance work; and
- The first three of these measures are within the reviewed KPIs. The final measure is included for the first time.

The confidence ratings awarded to each of the measures are set out below, using a grading system which has been slightly revised from last year. In summary, three measures have improved (one by virtue of the revised scoring mechanism), five remain the same and one is a new measure. The three that have improved are:

- Fatalities and Weighted Injuries Rate;
- Accident Frequency Rate; and
- Category 'A' SPADs 20+ (awarded the new A1* grade).

Fatalities and Weighted Injuries Rate

This was rated B3 at the previous audit because of the problems noted with the reporting of staff accidents. NR has put in place arrangements to tackle these shortcomings and these are being reflected in more appropriate levels of accidents being reported. Given these issues the appropriate rating is B2. This matches the ORR benchmark grade of B2. The highest Confidence Rating reasonably possible for this measure is considered to be A2 which will rely on a higher degree of automation within the data collation process between SMIS and the KPI suite.

Accident Frequency Rate

This was rated B3 at the previous audit because of the problems noted with the reporting of staff accidents. This KPI uses the same data as FWIR so the issues are the same. NR has put in place a lot of actions to tackle these shortcomings and these are being reflected in more appropriate levels of accidents being reported. Given these issues the appropriate rating is B2. This matches the ORR benchmark grading of B2. The highest Confidence Rating reasonably possible for

this measure is considered to be A2 which will rely on a higher degree of automation within the data collation process between SMIS and the KPI suite.

Passenger Safety Indicator

This measure was rated B3 at the previous review. The KPI relies on a complex mix of model outputs and actual data and is therefore unlikely to ever be capable of delivering the highest levels of accuracy, but it is a well documented process that remains stable. B3 therefore remains the rating. The ORR benchmark grading is B3. The highest Confidence Rating reasonably possible for this measure is considered to be B3 because of the likelihood that some passengers will not report accidents.

Category 'A' SPADs 20+

The measure was rated A1 at the last review, which at the time was the highest grading available. This remains a highly documented and controlled process covering a relatively small data set with a series of inbuilt checks. The revised confidence grading process now has a higher A1* grading requiring accuracy to within 0.1%. Given the accuracy levels demonstrated this KPI has been graded A1* which matches the ORR benchmark score.

Irregular Working

This measure was rated B3 at the last review. NR is expending a great deal of effort to improve data and information in this area and it is believed this will continue to improve the processes in the future as the initiatives come to fruition. However, these initiatives are very much work in progress and, for the present, the rating remains at B3. This matches the ORR Benchmark. In the longer term following an improvement in safety culture both within NR and its contractors then a score of B2 may be achievable.

Infrastructure Wrong Side Failures

This measure was rated A1 at the last review. The detailed review undertaken confirms that the KPI accurately captures all events as required. The measure remains at A1 which exceeds the ORR Benchmark of A2.

Route Crime

This KPI was rated B3 at the last review. The procedures remain largely unchanged from the last audit. The processes for capturing the data are well defined but rely on various sources, and are also largely unchanged from the last audit. Crime data will never capture every event given its nature and B3 remains the appropriate measure. This matches the ORR benchmark of B3 which given the issues around identifying and capturing incidents is considered to be the highest reasonably achievable rating.

Level Crossing Misuse

This measure was rated A3 at the last review. The process for the overall KPI is well defined. There remains a degree of unreliability with near miss reporting which is unlikely to improve much beyond its current level. The measure remains at A3. This matches the ORR Benchmark of A3. Any effort to raise this measure higher will require an intensive focus on the reporting of near misses by drivers or increased use of systems such as forward facing CCTV on trains.

Red Zone Green Zone

This is the first time that Red Zone/Green Zone working has been reviewed. Because there is no formal KPI requirement there are no clear guidelines on how the data should be recorded and no in-built checks. Accordingly the measure is ranked as C4. ORR has set a benchmark of B3 for the measure. In the view of the Reporter Team, the highest reasonably possible ranking is B2 based on a clear definition of the data to be captured and the process being clearly set out and followed.

1 Introduction

1.1 Background

Arup was appointed by the Office of Rail Regulation (ORR) and Network Rail in 2009 to undertake the role of Independent Reporter (Part 'A'). This commission requires the Reporter to review a series of measures produced by Network Rail for the ORR to ensure their correctness. These reviews are undertaken as part of a rolling programme and are reported to the ORR in a series of Quarterly Reports. This report covers the Reporter's data assurance activities in Quarter 3 of 2011/2012, the remit of which is included in Appendix A.

1.2 2011/12 Q3 Report

This report describes the data assurance review undertaken during Q3 2011/12. The review covered the following Safety KPIs:-

- Fatality and Weighted Injuries Rate (FWIR);
- Accident Frequency Rate;
- Passenger Safety Index;
- Category A Signals Passed at Danger ranked 20+;
- Route Crime;
- Level Crossing Misuse; and
- Infrastructure Wrongside Failures.

The last Safety KPI audit, which was in Q3 2010/11, concentrated in particular on the reporting of accidents and the requirements of RIDDOR. This year's remit set out the requirement to focus on the following areas:-

- RIDDOR Reporting by sub-contractors and labour only suppliers - last year's review looked at Principal Contractors only;
- Infrastructure Wrongside Failures - the process was under review at the time of the last audit and an audit of the revised arrangements was therefore mandated;
- Irregular Working – carry out a further review into how irregular working is identified and reported; and
- Red Zone/Green Zone - review how Network Rail records the proportion of hours worked under both red and green zones for maintenance work.

The findings of all but the final area are included within the relevant KPI. However, red zone/green zone is not reported within the KPIs reported through the Safety and Environment Assurance Report (SEAR). As a result, the findings are included in a separate section from the main KPIs.

2 Recommendations

The table below shows the progress made against the recommendations for safety improvements made last year. The recommendations from last year's report were managed alongside those made in a separate review carried out by RSSB into the reporting of RIDDOR accidents.

No.	Recommendations	Owner	Target completion date	Progress
2011SAF01	Implement a robust internal verification processes for accident reports to identify any shortcomings in reporting or classification.	Rod Reid	Apr-11	Revised suite of data assurance checks are now in place, having been added to the 'Safety KPI Compilation Guide'. Checks are now being carried out in accordance with the process and records were seen of checks carried out by the Safety Reporting Team. Some of the cross-checking with the ORR RIDDOR data are very new and were in progress at the time of the audit. **Closed**
2011SAF02	Standardise the requirements for near miss/close call reporting. Several different processes are being developed and these should be unified.	Rod Reid	Apr-11	There is now a single close call reporting project within Network Rail which is developing a Close Call System database, linked to SMIS. This will initially be rolled out within the Investment Projects contractor community. A paper was tabled on 13 June 2011 at TSG setting out proposals for wider roll-out across Network Rail, including linkages with the Safety Culture and Leadership Programme. The roll out of the system is still in its early stages and will require continued effort to embed. **Closed**
2011SAF03	Carry out a review of the accident reporting procedures and departmental practices and ensure that any parallel arrangements (e.g. SIA) do not compromise the accuracy or quality of the formal reporting arrangements. This review should include issues raised in this report, for example, those covering the use of the 2072 forms.	Rod Reid	Jun-11	A working group was convened to review the company's suite of accident/incident reporting and investigation standards and guidance (including those related to workforce injury accidents). The working group included representatives from RMT and TSSA and met on 25 March 2011 to review the proposed actions arising from the RSSB review report and other changes needed to the suite of standards. The standards have been revised and are currently undergoing stakeholder consultation. However, and principally owing to the workload involved in developing the new standards (note that the revision also included conversion of the standards to a modular format with 'Rule Book' style layout), publication date was revised to 3 December 2011, with the compliance date of 3 March 2012. Feedback

No.	Recommendations	Owner	Target completion date	Progress
				received on the new style/layout has been positive. The current Local and Formal Investigation courses are to be replaced by a computer-based Accident Investigation Learning Programme – its implementation is currently planned for October 2011. This will incorporate the reasons for accidents being undertaken and the identification of both the immediate and underlying causes, including any management system/process issues. The Investigators' Handbook was published and made available on the Accident Investigation page of Connect in July 2011. It provides guidance to investigators and designated competent persons on Network Rail's investigation processes and also includes guidance of the reasons for accident accidents being undertaken and the identification of both the immediate and underlying causes, including any management system/process issues. A new 'Accident Reporting' page has been developed for Connect that informs employees and line managers of what needs to be done if an employee has an accident, or is assaulted, whilst at work. It also provides guidance to employees and line managers on RIDDOR reporting, e.g. types of injuries to be reported, calculating length of absence (for 'over 3 days' cases), who reports and to whom. The new Connect page was implemented, following review by relevant stakeholders and the working group referred to in 5.2, on 3 December 2011 at the same time as the new standards/modules were published. Arrangements have been made with HR and Workplace Management to include, in the 'new employee' and 'buildings' induction programmes, brief details about accident reporting and directing attendees to the new 'Accident Reporting page on Connect for more detailed information.

No.	Recommendations	Owner	Target completion date	Progress
				Initial discussions have also been held with RMT on the greater involvement of safety representatives in the investigation processes (i.e. as part of investigation teams, where they will be involved in the development of appropriate recommendations) and criteria for their involvement are to be developed and reviewed at the Safety Council. **Closed**
2011SAF04	Carry out a review of local accident reporting procedures, most of which are un-documented, and adopt the good practices nationally. If appropriate include in line standards.	Rod Reid	Jun-11	This has been managed jointly with 2011SAF03 and the relevant standards re-issued on 3 December 2011. **Closed**
2011SAF05	Set up a contractor forum with appropriate representation with the aim of improving the overall quality and consistency of accident reporting by contractors.	Rod Reid	Mar-11	The Infrastructure Safety Liaison Group (ISLG), on 16 March 2011, agreed to take on the role of this forum, with specific ISLG Working Group (Infrastructure Safety data Group) in support. **Closed**
2011SAF06	Review the definitions and management of Irregular Working, in particular improving the classifications and initial reporting to improve real time management.	Rod Reid	Jun-11	The definitions and management of Irregular Working have been reviewed and Network Rail standard NR/L3/INV/3001/RM110 'Reporting and Investigation Manual – Irregular Working – Reporting and Risk Ranking' (Issue 1) has been appropriately amended (issue date – 3 December 2011 and compliance date 3 March 2012). A steering Group and a Working Group have been created to oversee improvements in the management of Irregular Working and a set of action plans are in place to deliver this. **Closed**

3 KPI Review

3.1 Audit Methodology

The primary method of investigation has been to hold structured interviews with relevant managers within NR. Initial interviews were held with the central reporting team and then subsequent interviews were held down the reporting chain. A summary of the meetings held is shown in the following table:-

Date	Network Rail Attendees	Location
07.11.11	Head of Health and Safety Systems, Safety Management System Specialist	Kings Place, London
10.11.11	Asset Reporting Specialist	40 Melton Street, London
11.11.11	Safety Improvement Specialist, Maintenance	40 Melton Street, London
14.11.11	Safety Information Analyst Safety Data Processor	Kings Place, London
14.11.11	Principal Asset Reporting Specialist, Signalling	40 Melton Street, London
14.11.11	Principal Asset Reporting Specialist, Track	40 Melton Street, London
16.11.11	Principal Health and Safety Specialist, IP	40 Melton Street, London
16.11.11	Principal Asset Reporting Specialist, Structures	40 Melton Street, London
17.11.11	Assurance Assistant - Accident and Investigations, IP	Milton Keynes
17.11.11	Safety Reporting Manager	Milton Keynes
29.11.11	Safety Information Analyst	Kings Place, London
06.12.11	SINCS Engineer, GW	Sussex House, Reading
12.12.11	RAM (Track) LNE	Hudson House, York
12.12.11	Workforce HSEA, NE	Biscuit Warehouse, York
12.12.11	IP HSEA, LNE	Hudson House, York
15.12.11	SINCS Engineer (x2), LNWS	Mailbox, Birmingham
15.12.11	RAM (Track) LNWS	Mailbox, Birmingham
15.12.11	IP HSEA S&E, LNW	Mailbox, Birmingham
16.12.11	Route HSEA (Scotland) Workforce HSEA	Buchanan House, Glasgow
16.12.11	Operations Risk Advisor, Scotland	Buchanan House, Glasgow
20.12.11	Operations Risk Advisor, East Mids	EMCC, Derby
16.01.12	Labour Only Supplier	Dorset
18.01.12	Labour Only Supplier	Kent

In addition a project start up meeting was held with NR and ORR on the 4 November 2011 to clarify the requirements and to assist in agreeing which managers should be seen in order to fulfil the remit.

Data was collected from the relevant meetings. From this data, accuracy checks were carried out to ensure that numbers were correctly reported through at each stage.

The meetings were led by Phil Dargue and Keith Winder from the Reporter Team. They were assisted by Jason Hogg who undertook the detailed data checks.

3.2 Audit Findings

3.2.1 Fatalities and Weighted Injuries Rates (FWIR) and Accident Frequency Rate (AFR)

3.2.1.1 Definitions

FWIR

Indicator: The weighted number of personal injuries to the workforce reported in Safety Management Information System (SMIS) per 1,000,000 hours worked.

Purpose: Monitor the rate of workforce accidents against the objective to continuously improve the Health and Safety of Network Rail and Contractor staff.

Definition: The weighted number of personal injuries to members of the workforce reported in SMIS. This comprises of those defined as reportable under RIDDOR 95, as well as those which are not reportable, normalised per 1,000,000 hours worked.

AFR

Indicator: The number of RIDDOR reportable personal injuries to the workforce reported in SMIS per 100,000 hours worked.

Purpose: Monitor the rate of workforce accidents against the objective to continuously improve the Health and Safety of Network Rail and Contractor staff.

Definition: The number of personal accidents to members of the workforce reported in SMIS. This comprises of those defined as reportable under RIDDOR 95, normalised per 100,000 hours worked.

3.2.1.2 Reliability - Process and Procedures

The data collection processes remain unchanged since the last audit. However following the previous audit and the separate, detailed review of RIDDOR reporting by the RSSB there has been a focus on ensuring that all staff and contractor accidents are reported. This review has had a very wide ranging focus on areas such as the cultural aspects of accident reporting rather than just the reporting procedures themselves. One major area of focus has been on the introduction of a wide ranging suite of data checks. These include, for example, checks between the SMIS records for RIDDOR accidents against the ORR

records over the same period. This check was underway at the time of the audit. The checks also include regular reviews of accident ratios of RIDDOR minor to major across all the departments.

The NR review has led to the removal of accident target rates at all but the highest level (where it is an HLOS requirement) and the abolition of any links to bonus schemes. There is now a regular review of accident ratios between RIDDOR minors and majors to compare them to UK industry norms. These norms differ between maintenance staff and project staff. As a result of these changes there has been a notable increase in RIDDOR minor accident reporting. The minor to major ratio for maintenance staff has risen from 0.95 to 1 in 2009/10 to 4.5 to 1 for the first 7 periods of 2011/12 which is more in line with expected rates. The Investment Projects (IP) rate over the same period has in comparison only risen from 0.45 to 1 to 1.6 to 1 against an expected norm of 2 to 1 seen in the construction industry. NR is continuing to monitor this and encourage open reporting.

3.2.1.3 Sub-Contractors and Labour Suppliers

During the last audit, the Reporter Team looked in detail at the processes followed by principal contractors, each of whom had sophisticated reporting processes designed to comply with their own legal duties as well as reporting accidents to clients. The remit for this year's report included a specific requirement to visit a sub contractor and/or labour only suppliers to review how they report staff accidents, and to ascertain how the cascade of initiatives and policy from NR reaches down through the contracting organisations.

These visits were very difficult to arrange – many of the sub-contractors are small organisations working from remote premises, with a nucleus of very busy Directors and Managers. Two meetings, with contrasting labour-only suppliers were eventually established, at which a review of their management arrangements in general, and their accident recording and reporting arrangements in particular, was undertaken.

One of these suppliers has 11 years experience of sub-contracting for labour supply in the rail industry, and supplies specialist, safety critical personnel for COSS, ES, Lookout duties etc for one particular main contractor. The other is a relatively recent entrant to the industry (less than 12 months) and is providing mainly non-skilled labour to a particular main contractor. Both have 'qualified' through the LinkUp accreditation scheme, and the established sub-contractor described the annual accreditation audit undertaken. Both receive regular updates of Network Rail Line Standards through these arrangements – the established sub-contractor had good records to this effect, whilst the new entrant was receiving this documentation, but seemed unsure what use he would be able to make of this extensive document suite.

In terms of accident reporting, neither sub-contractor had had any recent accidents. The established sub-contractor was able to demonstrate good records and investigation data for their most recent accident – 2 years ago – and was clear about their recording, investigation and reporting responsibilities. A cursory examination of relevant records in the office appeared to confirm that this sub-contractor holds thorough personnel records covering key safety critical elements (such as Medical and disciplinary records), and has equally thorough records of

induction, competence, refresher training and assessments. The new entrant was much less familiar with his responsibilities in this area, and although a determined effort was being made to 'skill up' both the company and key individuals in safety knowledge and practice, this was very much a work in progress, and the principal Director working on the rail contracts acknowledges that he, and the company, were well down the learning curve. As a result, understanding of accident recording, investigation and reporting requirements was generally poor. The company had also received relatively little guidance from the sponsoring main contractor – contractual documentation between the two companies was seen, and this makes no specific mention of accident reporting requirements, for instance.

It was apparent that the sub-contractors were, to a large extent, expected to educate themselves on changes, developments and any new requirements – whether requirements of the client (NR), or legislative/legal requirements. NR's efforts over the last year to raise the profile of near miss/close call reporting, and to clarify definitions, had not reached either sub-contractor. Not only were they unaware of the NR definitions, or where they could be found, but they were unaware of any attempt to raise or improve reporting levels.

In practice, even with good quality guidance and briefing to sub-contractors, reporting of incidents and minor accidents within this itinerant workforce will always be a challenge. All the personnel working for these sub-contractors are self employed, and work is not particularly plentiful, and certainly not secure. Any individual who has work through such arrangements tends to guard it carefully, and will not want to be seen as troublesome or risk in any way losing a position. As a consequence, it appears that close call reporting amongst this workforce is almost unheard of – and most minor accidents will be shrugged off and not reported – although in fairness to the two sub-contractors, the reporter team saw no tangible evidence of non-reporting or under-reporting by their personnel.

3.2.1.4 Data Accuracy

The data for the National Workforce Fatalities and Weighted Injuries (FWIR) was checked against the SMIS data provided in the SEAR Period 7 report. The source data was provided for the Periods 1 – 13 from 2008/09, 2009/10 and 2010/11 and Periods 1 – 8 from 2011/12. The data from Period 8 2009/10 to Period 7 2011/12 was compared against the report and the graph was accurately reproduced.

The data for the Accident Frequency Rate (AFR) was checked against the raw data provided. The graph in the SEAR Period 7 report was reproduced with the only difference being the non inclusion of a road traffic accident fatality in P4 which is not required to be reported in AFR (although it is included in the FWIR). The same periods of data was provided for the AFR as for the FWI.

3.2.1.5 General Observations

There has been a commendable uplift in the extent of cross checking of records between functions, Routes and reporting agencies. Whilst this was particularly noticeable in respect of RIDDOR reporting, following the issues identified last year, all functions and Routes now corroborate their data with that held in SMIS every period, and some even undertake a weekly teleconference with the Safety Reporting team at Milton Keynes to verify entries. Not only does this ensure the

most comprehensive level of data capture, it also ensures consistency in the reporting of event data from the different management systems employed.

3.2.1.6 Conclusions

The steps taken since the last audit have enabled NR to improve the overall processes in this area and the improved levels of reporting appear to support this. NR is continuing to focus on future improvements.

3.2.1.7 Confidence Ratings

Fatalities and Weighted Injuries Rate

This was rated B3 at the previous audit because of the problems noted with the reporting of staff accidents. NR has put in place arrangements to tackle these shortcomings and these are being reflected in more appropriate levels of accidents being reported. Given these issues the appropriate rating is B2. This matches the ORR benchmark grade of B2. The highest Confidence Rating reasonably possible for this measure is considered to be A2 which will rely on a higher degree of automation within the data collation process between SMIS and the KPI suite.

Accident Frequency Rate

This was rated B3 at the previous audit because of the problems noted with the reporting of staff accidents. This KPI uses the same data as FWIR so the issues are the same. NR has put in place a lot of actions to tackle these shortcomings and these are being reflected in more appropriate levels of accidents being reported. Given these issues the appropriate rating is B2. This matches the ORR benchmark grading of B2. The highest Confidence Rating reasonably possible for this measure is considered to be A2 which will rely on a higher degree of automation within the data collation process between SMIS and the KPI suite.

3.2.2 Passenger Safety Indicator

3.2.2.1 Definition

Indicator: Train accident risk as measured by the Precursor Indicator Model (PIM) added to the Fatality and Weighted Injuries for all accidents to passengers at Station Level Crossings and Network Rail Managed Stations per 1,000,000 passenger kilometres.

Purpose: Monitor the risk to passengers at Network Rail Managed Stations and whilst travelling on Network Rail Managed Infrastructure.

Definition: All injuries reported in SMIS as occurring to passengers at Managed Stations will be counted including those resulting from criminal acts as well as accidents.

3.2.2.2 Reliability - Process and Procedures

The data processes remain unchanged from the last audit. The measure consists of two distinct elements. The Precursor Indicator Model (PIM) is a risk management indicator assessing risk to passengers whilst travelling on trains maintained by

RSSB. The second element is based on actual accident data on Network Rail managed stations. The Reporter Team have not carried out any audit of the PIM.

The station accident data is compiled in SMIS. A report is run at the end of each period from SMIS to highlight any relevant events and these are reviewed by the Health and Safety Systems Headquarters team to confirm if they are RIDDOR events or not. A separate verification is carried out against RSSB data on a quarterly basis. There are often issues of definition around accidents and these can occasionally lead to debates around the classification of accidents. For instance a passenger suffering injury following a confirmed epileptic attack is not classified as an accident and would be sifted out at the report stage if it had been classified as one initially by the Safety Reporting Team. Any amendments to the reporting are recorded so that there is an audit trail of changes made.

There is always a likelihood that accidents to passengers will go unreported and it is inevitable that this measure will never be fully reliable. Passengers involved in falls often will not report their accident and there have been cases of quite serious injuries only coming to light much later, often when making a compensation claim.

However, the processes appear well structured for capturing the data relating to accidents that are reported and there are sensible in-built checks. NR need to ensure that the forthcoming changes in the Safety and Compliance Team when they move to Milton Keynes retain these checks.

3.2.2.3 Data Accuracy

Again, historic data was received from Period 1 2008/09 to Period 8 2011/12 and checked against the values shown in the graph in the SEAR Period 7 report. The graph was accurately reproduced from the data supplied indicating that the source data is a perfect match to the data used in the production of the report.

3.2.2.4 General Observations

The overall process for data collation remains stable. As in previous audits the Reporter Team have not carried out any detailed assessment of the PIM.

3.2.2.5 Conclusions

The process remains stable with no major changes from previous observations.

3.2.2.6 Confidence Rating

This measure was rated B3 at the previous review. The KPI relies on a complex mix of model outputs and actual data and is therefore unlikely to ever be capable of delivering the highest levels of accuracy, but it is a well documented process that remains stable. B3 therefore remains the rating. The ORR benchmark grading is B3. The highest Confidence Rating possible for this measure is considered to be B3 because of the likelihood that some passenger will not report their accidents.

3.2.3 Category A SPADs ranked 20+

3.2.3.1 Definition

Indicator: Number of Category 'A' SPADs that are risk ranked 20+.

Purpose: Monitor the high risk SPAD incidents to allow action to be taken to reduce the number occurring therefore improving safety.

Definition: Category 'A' is defined when any of the following is involved:

i. A stop aspect or indication;

ii. End of in-cab signalled movement authority or indication (and any associated preceding cautionary indications); or

iii. Verbal and/or visual permission given by a hand-signaller, which was, according to immediately available evidence, displayed or given correctly and in sufficient time, for the train to be stopped safely at the signal, board or end of in-cab movement authority.

3.2.3.2 Reliability - Process and Procedures

This is currently a very tightly controlled process with a master SPAD data record list maintained by the Safety Data Processor in the Safety and Compliance Team in Kings Place. Each Category 'A' SPAD is recorded on a spreadsheet which is updated based on information received from the investigation team. This is cross-checked against the data contained in SMIS as a safeguard. The numbers of SPADs means that this manual process is more than capable of ensuring that the data are correct. Given the highly sensitive nature of SPADs each is subject to a considerable amount of management investigation and there is little likelihood that any will fail to be recorded. An additional check is carried out against the RSSB database which acts as a useful comparator.

As with some of the other KPIs it will be important that NR ensure that this process remains as robust when the workload is moved to Milton Keynes and some of the current in-built checks are removed.

3.2.3.3 Data Accuracy

The SPADs source data was provided from Period 9 2008/09 to Period 8 2011/12. Again, the data was checked against the graph shown in the SEAR Period 7 report and the graph was accurately reproduced from the source data. This would indicate that the data provided is from the same source as the data used to produce the report.

3.2.3.4 General Observations

The process requires a lot of manual intervention which ensures close management of SPAD data. There is a high degree of crosschecking across various record sets, including TOC and RSSB records to ensure that all SPADS are both recorded and risk ranked accordingly.

The change to the London based reporting team does pose a risk to this and NR should ensure that the integrity of the current arrangements are not compromised when transferring the work to Milton Keynes.

3.2.3.5 Conclusion

The SPAD reporting arrangements continue to ensure accurate reporting of 20+ ranked SPADs.

3.2.3.6 Confidence Rating

The measure was rated A1 at the last review, which at the time was the highest grading available. This remains a highly documented and controlled process covering a relatively small data set with a series of inbuilt checks. The revised confidence grading process now has a higher A1* grading requiring accuracy to within 0.1%. Given the accuracy levels demonstrated this KPI has been graded A1* which matches the ORR benchmark score.

3.2.4 Route Crime

3.2.4.1 Definition

Indicator: Number of Malicious Acts on Network Rail Managed Infrastructure and at Network Rail Managed Stations per 100 Route Miles.

Purpose: Monitor the control of malicious acts on Network Rail's Managed Infrastructure to allow effective action to be taken to maintain and improve safety.

Definition: Malicious acts are those acts that are deliberately undertaken with intent to endanger train operations, passengers or workforce, or damage or deface property or structures.

3.2.4.2 Reliability - Process and Procedures

The process remains largely unchanged from last year. Route crime data is sourced initially from Route Control logs, TOC logs where incidents may have missed the NR logs and from BTP sources. The latter source does flag up incidents not reported elsewhere but the data held by BTP is not openly available for NR to check. All the incidents are logged in SMIS and a summary report is produced by the Safety Reporting Manager every period, breaking the events down into 5 key categories. This report is used to create the KPI data in the SEAR.

It is likely that incidents will go unrecorded within the KPI since not every incident will be logged but those that are recorded in control logs are reported correctly within the KPI.

3.2.4.3 Data Accuracy

Raw data was provided from Period 1 2009/10 to Period 8 2011/12. The data was checked from Period 8 2009/10 to Period 7 2011/12 and the graph in the SEAR

Report was accurately reproduced. Again, this indicates that the data output in the report is the same as the raw data provided to the Safety Audit team.

3.2.4.4 General Observations

The process is dependent on manual reporting and is unlikely to ever pick up all events. The linkages with the BTP remain largely informal and the level of information sharing differs by BTP location. This will vary across the various sub categories, however, with key areas such as cable theft much more likely to be accurate given the impact on the network as opposed to lower level vandalism incidents.

3.2.4.5 Conclusions

The KPI reporting remains stable on previous reviews.

3.2.4.6 Confidence Rating

This KPI was rated B3 at the last review. The procedures remain largely unchanged from the last audit. The processes for capturing the data are well defined but rely on various sources, and are also largely unchanged from the last audit. Crime data will never capture every event given its nature and B3 remains the appropriate measure. This matches the ORR benchmark of B3 which given the issues around identifying and capturing incidents is considered to be the highest reasonably achievable rating.

3.2.5 Level Crossing Misuse

3.2.5.1 Definition

Indicator: Number of incidents where a motorised vehicle is struck by, or strikes a train, or any incident where a non-motorised vehicle or pedestrian is struck by a train, or any near misses with a motorised vehicle, or non-motorised vehicle or pedestrian.

Purpose: Monitor the level crossing incidents thus allowing action to be taken to reduce the number occurring and improve safety at key points of Network Rail / Public interface.

Definition: Incidents where a motorised vehicle is struck by, or strikes a train, any incident where a non motorised vehicles or pedestrian is struck or any near misses with motorised, non motorised vehicles or pedestrians. In respect of level crossing incidents, a ‘near miss’ is an event involving a train which nearly strikes a person or road vehicle, and which either necessitated emergency braking to be initiated by the train driver or occurred too late for such action to be taken. Where a train strikes a pedestrian and the pedestrian is fatally injured the incident is classed as a ‘train striking a pedestrian’. Where a train strikes a pedestrian and the pedestrian is not fatally injured the incident is classed as a ‘near miss with non vehicle users’.

3.2.5.2 Reliability - Process and Procedures

The process remains unchanged from last year. Incidents are reported to Route Controls and the Safety Reporting team pick up the incidents from the relevant logs. The incidents are recorded in SMIS and each period the Safety Reporting team send the data broken down by Route and by reporting category to the Safety and Compliance team in the Safety Information Database (SID). Additional checks are carried out by the Safety Information Analyst against between entries in SID and SMIS to confirm that they are correctly attributed.

3.2.5.3 Data Accuracy

The level crossing raw data was provided from Period 9 2008/09 to Period 8 2011/12. The period from Period 8 2009/10 to Period 7 2011/12 was checked against the data presented in the SEAR Period 7 report and the graph was accurately reproduced from the data provided.

3.2.5.4 General Observations

The process has not changed since the previous review. However, like other measures reviewed the process currently has in built checks undertaken by the Safety and Compliance team in London. It will be important to ensure that any such processes are not compromised by the organisation change.

3.2.5.5 Conclusions

The KPI reporting remains stable on previous reviews.

3.2.5.6 Confidence Rating

This measure was rated A3 at the last review. The process for the overall KPI is well defined. There remains a degree of unreliability with near miss reporting which is unlikely to improve much beyond its current level. The measure remains at A3. This matches the ORR Benchmark of A3. Any effort to raise this measure higher will require an intensive focus on the reporting of near misses by drivers or increased use of systems such as forward facing CCTV on trains.

3.2.6 Irregular Working

3.2.6.1 Definition

Indicator: Number of Potentially Severe and Potentially Significant Incidents of Irregular Working.

Purpose: Monitor the number of Potentially Significant and Potentially Severe incidents and, by examination of the circumstances surrounding them, attempt to reduce the overall level of risk associated with works carried out.

Definition: “An act by a person that has a direct potential for safety loss; such an act may occur when a rule, process or procedure is not followed or is not correctly followed.”

3.2.6.2 Reliability - Process and Procedures

Since the last audit NR has put a large amount of focus on the identification and management of irregular working. A national Irregular Working Group has put in place an action plan looking at improving the processes in place and above this there is a steering group with senior representation from all the key functions. The overall purpose of both groups is:

> "To reduce the number and severity of Irregular Working events involving Network Rail staff or members of staff contracted to Network Rail."

An action plan tracker is maintained and was shared with the Reporter Team, with the specific actions aimed at improving the overall management of irregular working. Additionally a series of workshops chaired by the Safety Reporting Manager have been held with local managers to identify improvements. This shows the considerable amount of effort NR is undertaking to tackle this difficult area.

At the time of this audit a new standard was being introduced with a compliance date of 3rd March 2012 resulting from changes identified by the above processes.

In terms of the KPI reported within the SEAR, the current process is based on a central spreadsheet maintained by the Safety Data Processor. This sheet contains only those irregular working events which have the possibility of being classified as potentially serious or potentially severe. The spreadsheet is shared with all the functions and used as the basis of a regular telephone conference chaired by the Safety Reporting Manager each period. This conference is designed to ensure that by the end of Wednesday of week two of the following period the risk rankings on the events identified on the spreadsheet is complete. Any risk rankings not completed will be undertaken by the Safety and Compliance team in London. Various crosschecks are carried out against SMIS to identify any that may have been missed throughout the process. The spreadsheet does not track any other irregular working events.

The move of the Safety and Compliance team to Milton Keynes will involve changes to this process and NR need to ensure that the checks created by the current arrangements are maintained into the future.

To understand the process further the Reporter Team carried out a series of visits to review how irregular working is being captured and used in the management of safety across the key functions. These looked at Operations, Maintenance (both now part of Network Operations) and IP/Asset Management. Each of these has differences in how they manage irregular working and are therefore described separately.

(i) How NR Disciplines Report, Manage, and Categorise Irregular Working Events

Within ***Operations***, the requirement for capturing irregular working is well understood which, given that it was originally an operational concept, is not surprising. Events are captured initially by being reported to Network Rail's relevant Route Control. The follow up process does then appear to differ by Route. In Scotland and East Midlands, the Operations Risk Advisors (ORA) will ensure that the relevant reporting forms are completed and that the risk ranking is carried out in the ORA office. As this triggers the levels of investigation required,

it is felt that this should be independent of line management. The ORAs maintain their own register of events and ensure that each one is managed to conclusion. In some of the Routes though, it appears that the ORAs take no part in the process at all. In these Routes it appears to be left entirely to the Local Operations Managers to follow up and deal directly with the Safety Reporting team in Milton Keynes. The reasons for these differences were not fully apparent but may reflect the background of individual ORAs. Those with an operational background appear to take a much more 'hands on' approach.

For ***Maintenance***, the key roles in following up irregular working events are the Workforce Heath, Safety and Environment Advisors (WHSEAs), both at Route and depot level. They will follow up all incidents and ensure that the section managers complete their investigations. In some cases the WHSEAs will grade the risk rankings, in others it is carried out by the section managers with the final sign off by the WHSEAs. They will supply the requisite information to the safety reporting team in Milton Keynes to ensure SMIS is up to date. If the incident involved contractor staff it will be investigated in exactly the same way. A great deal of focus on getting lower level reporting is evident although success is difficult to assess. The team in York reported experiencing challenges in embedding the need for reporting lower level events given the prevailing culture of resistance to this type of reporting amongst frontline staff. However they were continuing to persevere.

Within ***IP and Asset Management,*** the irregular working events are collated by the Assurance Assistant - Accident and Investigations, who will ensure that the forms are completed and the risk rankings carried out. She attends conference to closedown events each period referred to earlier. In this case most irregular working events are identified within the Asset Management Control Centre (AMCC) log. These are then followed through by the individual project manager with the support of the relevant Health, Safety and Assurance Advisors (HSEAs). In this case the vast majority of incidents involve contractors who are briefed in the requirements of reporting irregular working events alongside other safety responsibilities and duties. The visits to HSEAs suggested that irregular working was still an ongoing issue for large projects with some difficulties within the process highlighted. These relate in the main to this being an Operations process originally, defined by 'Rules' transgressions or violations, which was felt to be a difficult fit for project work. This is an area of focus for the working group.

(ii) The Risks being Identified

It is a clear intention within NR to structure the processes for capture, reporting, and recording of IW events to maximise the identification of events, to create consistent methodology across the functions, and to standardise risk ranking procedures to ensure a clear understanding of safety risk. It is believed that effective overall management of these precursors to safety incidents will, in the medium and long term, have a positive impact on safety performance. Currently, there is a high standard of reporting in operations where the great majority of incidents carry a low safety risk – wrong routing of trains by signallers, for instance. However, in the largely construction-type environment within IP, and where contract labour is prevalent, there is a feeling amongst safety specialists that the concept of IW is not well understood, that reporting is patchy, and some significant risks may go unchallenged or at least under-reported.

At the last audit the development of differing close call reporting arrangements was highlighted. A new national close call reporting process is now being implemented on a trial basis. This is still in its infancy and issues have arisen around both the definition of a close call, and reporting levels which are only slowly increasing. The major aim is to encourage the reporting of events which in other circumstances could lead to serious consequences, but there is clearly still some way to go before this aim is achieved on a consistent and reliable basis.

One distinction between IP/Asset Management and Operations/Maintenance was noted in the handling of potential irregular working events noted during safety inspections or tours. IP carry out large numbers of safety visits to projects and detailed records of findings are kept. However, if these included irregular working practices they may not be reported to AMCC and therefore logged as events, especially if the matters were dealt with to conclusion at the time they were detected. In the case of the Operations and Maintenance teams, such events are much more likely to be reported to, and logged with, Route Control. Guidance should be given to ensure that any practices observed on visits that breach the standard are reported currently to control and logged in line with those reported by the more normal route.

(iii) How Close Call Data is being Used

The NR intention is that the reporting and recording of Close Call data will expose, and prioritise, risks which may not otherwise come to managerial attention; will identify a range of precursors, and encourage managerial action to prevent or mitigate accidents; and will begin to address cultural issues which create a resistance to reporting. It is fair to say that, whilst good progress is now being made, NR is some way from achieving the intention, and is still at the stage of defining process and procedure, and improving levels of reporting. How best to use the data reported and recorded, and how to ensure that NR disciplines are able to get the best from the information which flows from the data, are issues still to be fully addressed.

3.2.6.3 Data Accuracy

The raw data for Irregular Working was provided from Period 1 2009/10 to Period 8 2011/12. The period from Period 8 2009/10 to Period 7 2011/12 was checked against the output in the SEAR Period 7 report and the graph was reproduced accurately. The only difference was that the Moving Annual Average could not be fully replicated due to the data only going back as far as Period 1 2009/10. However, the data which could be replicated was accurate, again showing that the reported data is the same as the raw data provided.

3.2.6.4 General Observations

Irregular Working continues to be a difficult area within NR, and especially for NR's contractors and sub contractors. Whilst considerable energy has been applied nationally to improving definitions, raising awareness and raising both the level and consistency of reporting, there are considerable cultural barriers to overcome. A noteworthy aspect which emerged from interviews is that that there is wide variation between functions as to how irregular working detected on Safety Tours or during Planned General Inspections is dealt with. In Operations and Maintenance, such events will invariably be reported to Control – in other

functions, the event would often be dealt with at site, to conclusion, and not reported.

A similar level of endeavour has been applied to Close Call reporting with, once again, a national group reviewing the overall arrangements. One of the features noted during interviews is that understanding of reporting requirements is patchy, especially where an event has to be reported into more than one incident category – for instance, a close call which occurred as a result of irregular working has to be reported in both databases. A similar issue exists with risk ranking such events – although the guidance encourages 'worst case' ranking for such events, there was some evidence that this was not always followed especially when an event implicated more than one function.

The role of the Safety and Compliance team in London is vital within the current process. NR must ensure that the transfer of work to Milton Keynes ensures the integrity of the reporting is maintained.

3.2.6.5 Conclusion

NR continues to put a large amount of effort into improving the collection of irregular working data and achieving a higher level of consistency across the company in the reporting arrangements. It remains a very manual process with a high degree of interpretation at various levels. In relation to the specific issues raised in the Mandate,

- NR is actively seeking to engender consistency in how different disciplines report, record and categorise Irregular Working;
- Identification of risk remains patchy across the disciplines; and
- Close call reporting has been an area which NR has been keen to improve, but much work still remains to be done to improve reporting and recording levels, before the data can be used as an effective tool within safety management.

NR has recently added a detailed analysis with commentary of Irregular Working to the SEAR.

3.2.6.6 Confidence Rating

This measure was rated B3 at the last review. NR is expending a great deal of effort to improve data and information in this area and it is believed this will continue to improve the processes in the future as the initiatives come to fruition. However, these initiatives are very much work in progress and, for the present, the rating remains at B3. This matches the ORR Benchmark. In the longer term following an improvement in safety culture both within NR and its contractors then a score of B2 may be achievable.

3.2.7 Infrastructure Wrongside Failures

3.2.7.1 Definition

The KPI captures all infrastructure failures which have a hazard index of 50 or above. The definition of this KPI is not included in 'Safety Key Performance Indicators – Instructions for Compilation', the process for collation is instead covered by a document produced by the Asset Reporting Team, called 'Infrastructure WSFs with Hazard Index>=50 by Period'. A series of standards by engineering discipline define the ranking process for infrastructure failures. Failures ranked 20-49 are reviewed by each discipline but all those ranked at 50 or above are reported to the Network Rail Board and captured by this KPI.

3.2.7.2 Reliability - Process and Procedures

The overall data published within the SEAR is collated by the Asset Reporting Specialist within Asset Information based in 40 Melton Street. The Safety and Compliance team simply take the data as prepared and place into the SEAR without any further processing.

(i) How IWSFs are identified and Data Compiled

All infrastructure wrong side failures are reported in Route Control logs, with the most serious events also recorded in the National log. The data collation for the more serious events is covered in a separate procedure; Infrastructure WSFs with Hazard Index ≥ 50 by Period, AR-WI-31 last updated in November 2011. This sets out clearly who is responsible for reporting WSF information by technical discipline. Within each technical discipline there is a line standard setting out what constitutes a WSF and how it should be assessed. As an example the signalling procedure is: 'Management of Safety Related Reports for Signalling Failures', NR/L2/SIG/10047.

The overall process for reporting and risk ranking WSFs was reviewed internally by NR recently. This was because the figures for 50+ ranked incidents were dominated by fencing failures leading to animals on the line. This review reported back to Tactical Safety Group in February 2011 recommending changes to the risk ranking process following analysis of actual risk rates based on historical data. This led to some scores being raised as well as others being lowered. The net result in these changes is a reduction in the number of 50+ incidents for track with the other categories remaining broadly similar.

(ii) The Systems Used

Most WSFs are initially reported via a Contol Office into a Fault Management System (FMS) database, largely to ensure a fault reporting number is generated to effect repairs. For S & T, for instance, FMS has a Signalling Incidents (SINCS) folder, which generates a SINCS file for each incident, and the templated form for completion, including hazard ranking. For Track, all events are risk ranked in a separate database (known as Trackopedia), but all events are initially reported in FMS. Civils also use a bespoke database for recording and risk ranking, known as the CIV028 Register.

The Reporter Team met with the overall data champions for Signalling (and Telecoms), Track and Building and Civils. These account for the vast majority of 50+ and 20+ ranked events.

(iii) Data Management – Standards, Event Categorisation, Assessment, Risk Ranking and Sign Off

Buildings and Civils were in the process of reissuing the standard (NR/L3/CIV/028) at the time of the audit, with a planned compliance date of 3rd December 2011. Briefing was underway but was being delayed by the changes to NR structures brought about by devolution. The changes were partly driven to deal with lessons learnt from a serious derailment at the Falls of Cruachan in Scotland in 2010 caused by a rock fall. The application of the old standard ranked the incident with a low score despite the fact it could have led to the train falling into Loch Awe below the track. The new process is designed to give the engineers more scope to apply judgement.

Track, as already stated, was subject to more change from the review than other disciplines. A new ranking process form has been introduced to ensure greater consistency in the investigation and ranking of potential WSFs. Two visits were carried out to Route Asset Managers (Track) and their teams to see how they were identified and ranked. Differences were noted in the way this was done but the most noteworthy was how risk assessments are carried out. On LNE this is done by the Engineering Data Analyst, based initially on the information provided in Fault Management System and then by asking the relevant Track Maintenance Engineers (TME) to follow up. This was said to allow the RAM Track to be clear that all incidents were being properly investigated and followed up, and gave a very quick feel for the likely severity of the incident. On LNW the investigation and ranking was left to the TMEs initially but a note was sent by the Engineering Data Analyst requesting the investigation and ranking to be done. When the ranking was received this was then checked and the scoring challenged.

The new form set out the process on the front including various changes within the process based on the score awarded. If the score rises above 20 then the local Infrastructure Maintenance Engineer must sign off the form. If the score is above 30 then the RAM (Track) must add comments and if it rises above 50 then it must be signed off by the national Head of Asset Management (Track). It is these comments that form the basis of the commentary that appears for all 50+ incidents in the SEAR.

The process for scoring is reasonably prescriptive but does rely on accurate information on matters such as location. Given this level of prescription and the independent nature of the RAM (Track) role, there was no evidence of scores being artificially suppressed.

Whilst the Track process has changed and a new form issued, the standard has not. The current applicable standard: Reporting of Permanent Way Asset Failures, NR/L3/TRK/7002 is dated August 2008. This should be updated as soon as possible.

Apart from some minor changes, the signalling processes remained largely unchanged from the recent review. The data are collated by the Principal Asset Performance Specialist in Melton Street. This is provided by the SINCS Engineers based out in the Routes who are responsible for the ranking of any WSF and ensuring a full investigation takes place. To understand this process, the

Reporter Team visited two Routes and discussed the process with three SINCS Engineers.

These posts are designed to be independent from the line processes although on LNW they currently report to the Signal Maintenance Engineer at Sandwell and Dudley rather than the RAM (Signalling). All signalling failures are logged by Control in FMS but there are variations in this process. If it is clear that an event is a WSF then by clicking on the relevant tab in the system the controller opens a SINCS entry. The controller then has the ability to rank the failure using the line standard. However, LNW Control does not have technically competent fault controllers any longer. Therefore, they do not rank events; instead this is done by the SINCs Engineers the following day. At Derby Control in contrast there are technically competent fault controllers who do carry out the risk ranking. This is then independently verified by the SINCS Engineers later.

The signalling ranking process is very prescriptive. It has been developed over a long period of time and every failure mode has been assessed and scored within the procedure. As a result it gives individuals little scope for judgement or discretion in the scoring. There is no recognised competence standard for undertaking assessments.

One observation of the overall distribution of scores across the disciplines is that the ratio of 50+ incidents to 20+ incidents is much lower for signalling than the others. The Principal Asset Performance Specialist explained that this reflected in many cases signalling failures being further protected by the design of the system, e.g. a blown signal lamp failure will normally hold the signal in rear at danger and therefore the failure will score as low risk. In contrast a broken rail has inherently less in-built protection. The comparative risks were challenged as part of the overall review referred to earlier. The detailed review of the reporting arrangements suggests a robust set of arrangements which are applied diligently.

(iv) How Consistency is Maintained

Risk Ranking methodologies are now largely standardised across the disciplines as far as possible and, as stated above, are prescriptive in what is risk ranked and how. All the methodologies provide a ranking for physical characteristics of the asset, type of failure, location, and density of rail traffic, and all those involved in the process who were interviewed by the Reporter team confirmed that the scope for discretion (and therefore error) in the ranking process was very limited. Furthermore, the hierarchy of review for incidents and risk ranking, which in all disciplines, escalates to increasingly senior Managers as the risk score rises, provides both a substantial and independent review process to verify facts, investigation findings and risk rankings.

3.2.7.3 Data Accuracy

The data reported in the SEAR was checked against the data compiled by the technical specialists. The overall number of 50+ failures is a relatively small figure and the data checks found no discrepancies.

3.2.7.4 General Observations

The means by which risk ranking is undertaken varies across the functions and Routes. However, in all cases, the reporter team found the processes and

procedures were undertaken diligently and in a timely fashion, though achieving close out on incidents was a significant problem in several functions. The organisation structures around risk ranking and subsequent review appear generally to have created sufficient independence of personnel that undue pressure to rank in a particular way, or to artificially suppress rankings, is avoided. The reporter team found no evidence of any such perverse incentives. If anything, some Routes and functions appear to 'over score' events and incidents.

There is a degree of positive encouragement within the functions to err on the side of 'worst case' in initial reporting and ranking which usually ensures that subsequent re-assessment of risk ranking, as new information or details emerge from investigation, will reduce rather than increase risk scores. It was also suggested by a number of Managers during interviews, that inexperience and lack of technical training for Incident Controllers tend to result in often poor event/ incident description in the Control Log. Other Managers cited the demanding timescales for initial reports, investigation and risk ranking as a factor in the variable quality of initial assessments. In Signals, for instance, the number of incidents initially ranked 20+ was shown in evidence to reduce by as much as 50% following reassessment.

The review arrangements for incidents following risk ranking are broadly similar across functions and Routes, insofar as there is a structure of escalating seniority required the more serious the event, and the higher the risk score. Without exception, these arrangements were found to ensure an appropriate level of review by Managers of appropriate standing, who were independent of the line management.

3.2.7.5 Conclusion

The levels of check built in using independent engineering resource supported by well defined procedures means that the KPI is accurately reported with no evidence of pressures to deflate ranking scores artificially.

3.2.7.6 Confidence Rating

This measure was rated A1 at the last review. The detailed review undertaken confirms that the KPI accurately captures all events as required. The measure remains at A1 which exceeds the ORR Benchmark of A2.

4 Red Zone/Green Zone Working

4.1 Overview of the Process

The reporter review of Red Zone/Green Zone Working was the first such review in CP4. The proportion of Green v. Red Zone working is measured in the Maintenance function only, on a depot by depot basis, and data is published nationally each period. The "Going4Green" project has been seeking to lift the levels of Green Zone working nationally, and the level of awareness in the function of the need to maximise, or optimise, Green Zone working was consequently high.

NR Maintenance record on a periodic basis the method of protection used for staff whilst working on the lineside. The data are sourced from Ellipse which is the NR maintenance work management system used to record a wide variety of data, and support many maintenance processes, such as the asset maintenance requirements and the generation of requisite works orders.

The start point for the information is the requirement to plan the protection method as part of the Safe System of Work (SSOW) Pack which is a compulsory requirement when planning a job. This is supported by the works order generated by Ellipse which will set out the task required. The Section Planner within the area maintenance team will seek to plan the work in line with the safe working hierarchy within the line standard, i.e. seeking green zone protection first and then resorting to the various levels of red zone subsequently.

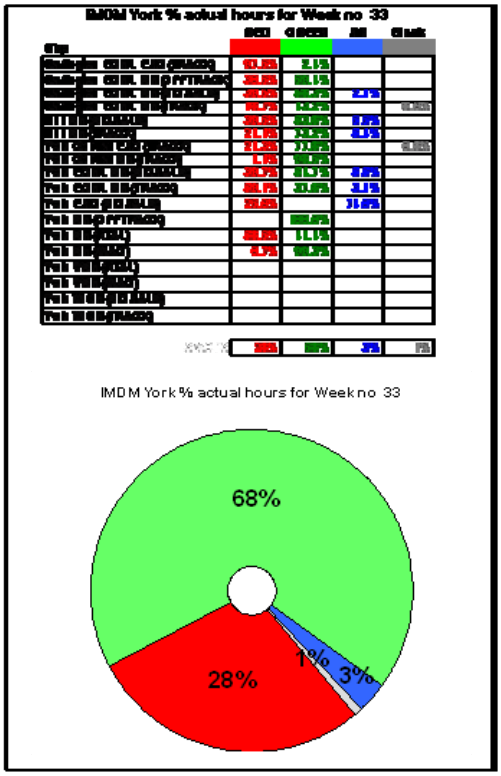
To book a green zone the planner must request it through a system called GZAC (Green Zone Access System). This system is used to pre-plan all green zone requests and is operated by the Lead Planner Teams based in the Routes. These posts currently are part of NDS but are due to transfer into the Route teams early in 2012. Without a pre-authority number issued through GZAC, any Controller Of Site Safety (COSS) who attempts to take a green zone will be declined by the signaller. There are pre-agreed maximum levels of green zone working allowed on each signalling section to manage workload for signallers. This can lead to conflicts on the utilisation of the green zone availability between IP/Asset Management contractors who require access and routine maintenance. The maintenance teams visited by the Reporter Team said that this system does cause them problems in planning work.

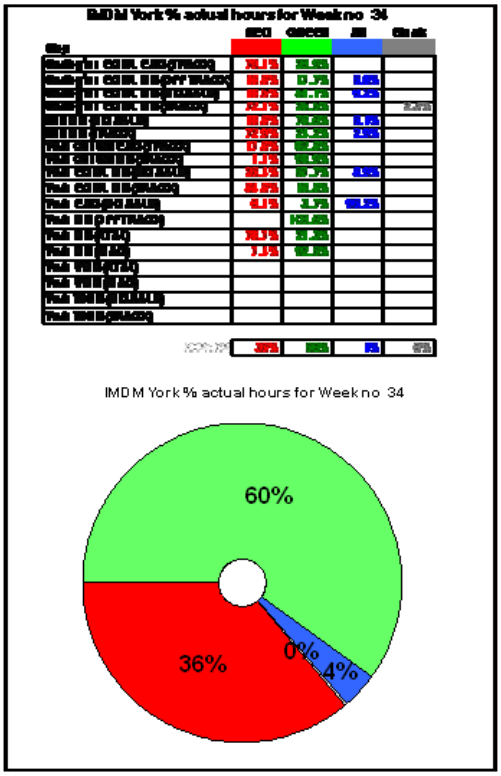
The actual recorded data for the hours worked in either red or green zone are sourced from Ellipse. Once work is completed a work order is returned to the Section Planner in the depot. This is then input into Ellipse. This will record the hours worked on site and the method of protection used. This will be the actual method used on the day rather than that on the SSOW pack. This means that if for some reason the planned green zone could not be used then the red zone working would be recorded (any change to the protection method by the COSS must be pre-authorised). However, if to get access to the work site the team have to use red zone protection this would not be recorded separately. Individuals Working Alone would be considered red zone. If the planner cannot record a protection method then it is considered to be red zone.

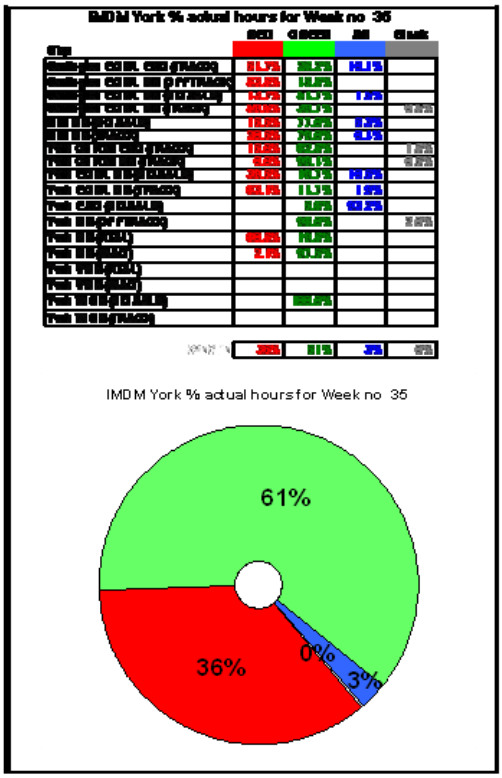
At a national level comparisons between different depots are made and a national project called "Go4Green" is underway to improve the overall proportion of work

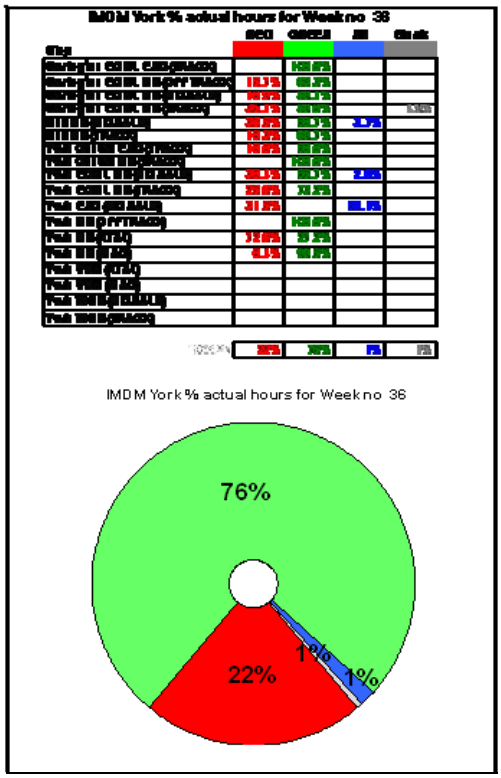
done in green zones. The data is pulled straight from Ellipse using a Business Objects query with no manual intervention.

At area level the figures also form part of the management review packs. For example the data published on the Infrastructure Maintenance Delivery Manager (IMDM) York area is shown below:

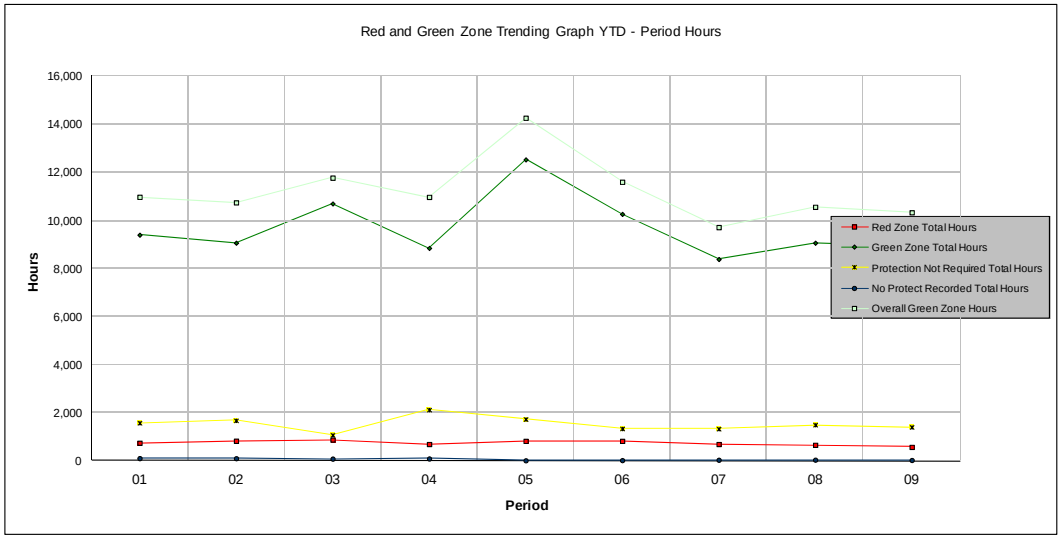








Scotland produces similar data which is reviewed with the senior management team on a regular basis. Below is an example of a graph discussed with managers produced by the WHSEA for the West Scotland IMDM team.



These two examples highlight large differences in the levels of red zone working on their respective areas. From discussions this appears to be driven mainly by the inability on the East Coast Main Line to get green zones for activities such as patrolling, and that a larger proportion of work in Scotland is done on nights where green zones are much more widely available.

There does not appear to be any check carried out on the accuracy of the data either at HQ or local level. The Area Planners simply input the data as recorded on the works order. Checks are made on the SSOW packs and site checks will look at compliance with them. Putting in place a detailed audit regime would prove challenging and it is questionable what it would achieve beyond that imposed by the current site checks.

4.2 Specific Observations

(i) The Quality of the Data

The guidance for compiling data in Ellipse is contained in the Work Management Handbook but it says little on the input of protection data and gives no guidance on what should be recorded. Whilst there is clarity over what protection systems constitute Red Zone working (see (ii) below), there is perhaps less clarity about some of the periphery activity, and how these are counted. NR need to specify clearly what data capture is required and how it is to be used.

(ii) What is deemed Red Zone?

A worksite is deemed to be Red Zone when there are:

- Individuals Working Alone;
- Protection from moving traffic is provided by locally activated Warning Systems for train approaching; and
- Protection is provided by physical Lookouts.

(iii) How is Data Recorded?

The guidance in the Work Management Handbook is clear that the input measure is the number of staff hours at work within the chosen safe system of work, and will not therefore include time spent travelling, booking on and off, briefing etc. The source of all data within Ellipse is the completed return, included with the original maintenance Works Order, which is filled out by the person in charge of the worksite or possession – this shows the number of hours completed by staff in the worksite within the three recorded categories:

- Hours in Red Zone;
- Hours in Green Zone; and
- Hours where protection was not required.

(iv) Consistency of Approach, Interpretation & Recording

With the limited review undertaken, it is difficult to draw adequate conclusions regarding consistency within the function. However, it is clear that the guidance offered to Managers within the maintenance function through the Work Management Handbook is very limited, and leaves considerable scope for interpretation and initiative, at the expense of consistency. If the measure is to assume a more significant status it will require clearer rules of data capture and guidance on compliance checks.

Also, it appears that the only cross-check or corroboration of the data recorded by site persons in charge is with the GZAC plan, and even then it is not clear whether WHSEAs routinely undertake the cross check or investigate discrepancies.

(v) Intelligence on Worker Protection and Levels of Risk from the Data

The national periodic return shows data for all Delivery Unit depots as follows:

- Hours in Red Zone;
- Hours in Green Zone;
- Protection Not Required;
- No Report; and
- % Green Zone v. Red Zone.

It is not entirely clear how meaningful the percentage metric is, or what action is generated by it. Given the repetitive and cyclical nature of maintenance, a “40% GZ depot” is likely to always be a 40% depot once the Green Zone arrangements have been optimised; similarly, a 90% depot is not necessarily “better” than a 60% depot, as both may be optimised around the type of work undertaken. What is of more interest, and is potentially much more meaningful, is the periodic variation in a depot score, and local Workforce HSEAs should be encouraged to focus on these measures to a greater extent.

4.3 Confidence Rating

This is the first time that Red Zone/Green Zone working has been reviewed. Because there is no formal KPI requirement there are no clear guidelines on how the data should be recorded and no in-built checks. Accordingly the measure is ranked as C4. ORR has set a benchmark of B3 for the measure. In the view of the Reporter Team, the highest reasonably possible ranking is B2 based on a clear definition of the data to be captured and the process being clearly set out and followed.

5 Confidence Ratings

This year's ratings are based on a revised grading system that has been defined by Network Rail and ORR. This is set out in Appendix A, but the major change is the introduction of a new accuracy rating of 1*, for when the data used to calculate the measure is accurate to within 0.1%.

In addition, ORR have defined benchmark grades that they believe Network Rail should be achieving. This is the first time that such benchmark grades have been introduced, and all parties have agreed to review their usefulness.

Fatalities and Weighted Injuries Rate

This was rated B3 at the previous audit because of the problems noted with the reporting of staff accidents. NR has put in place arrangements to tackle these shortcomings and these are being reflected in more appropriate levels of accidents being reported. Given these issues the appropriate rating is B2. This matches the ORR benchmark grade of B2. The highest Confidence Rating reasonably possible for this measure is considered to be A2 which will rely on a higher degree of automation within the data collation process between SMIS and the KPI suite.

Accident Frequency Rate

This was rated B3 at the previous audit because of the problems noted with the reporting of staff accidents. This KPI uses the same data as FWIR so the issues are the same. NR has put in place a lot of actions to tackle these shortcomings and these are being reflected in more appropriate levels of accidents being reported. Given these issues the appropriate rating is B2. This matches the ORR benchmark grading of B2. The highest Confidence Rating reasonably possible for this measure is considered to be A2 which will rely on a higher degree of automation within the data collation process between SMIS and the KPI suite.

Passenger Safety Indicator

This measure was rated B3 at the previous review. The KPI relies on a complex mix of model outputs and actual data and is therefore unlikely to ever be capable of delivering the highest levels of accuracy, but it is a well documented process that remains stable. B3 therefore remains the rating. The ORR benchmark grading is B3. The highest Confidence Rating reasonably possible for this measure is considered to be B3 due to the likelihood that some passengers will not report accidents.

Category 'A' SPADs 20+

The measure was rated A1 at the last review, which at the time was the highest grading available. This remains a highly documented and controlled process covering a relatively small data set with a series of inbuilt checks. The revised confidence grading process now has a higher A1* grading requiring accuracy to within 0.1%. Given the accuracy levels demonstrated this KPI has been graded A1* which matches the ORR benchmark score.

Irregular Working

This measure was rated B3 at the last review. NR is expending a great deal of effort to improve data and information in this area and it is believed this will continue to improve the processes in the future as the initiatives come to fruition.

However, these initiatives are very much work in progress and, for the present, the rating remains at B3. This matches the ORR Benchmark. In the longer term following an improvement in safety culture both within NR and its contractors then a score of B2 may be achievable.

Infrastructure Wrong Side Failures

This measure was rated A1 at the last review. The detailed review undertaken confirms that the KPI accurately captures all events as required. The measure remains at A1 which exceeds the ORR Benchmark of A2.

Route Crime

This KPI was rated B3 at the last review. The procedures remain largely unchanged from the last audit. The processes for capturing the data are well defined but rely on various sources, and are also largely unchanged from the last audit. Crime data will never capture every event given its nature and B3 remains the appropriate measure. This matches the ORR benchmark of B3 which given the issues around identifying and capturing incidents is considered to be the highest reasonably achievable rating.

Level Crossing Misuse

This measure was rated A3 at the last review. The process for the overall KPI is well defined. There remains a degree of unreliability with near miss reporting which is unlikely to improve much beyond its current level. The measure remains at A3. This matches the ORR Benchmark of A3. Any effort to raise this measure higher will require an intensive focus on the reporting of near misses by drivers or increased use of systems such as forward facing CCTV on trains.

Red Zone Green Zone

This is the first time that Red Zone/Green Zone working has been reviewed. Because there is no formal KPI requirement there are no clear guidelines on how the data should be recorded and no in-built checks. Accordingly the measure is ranked as C4. ORR has set a benchmark of B3 for the measure. In the view of the Reporter Team, the highest reasonably possible ranking is B2 based on a clear definition of the data to be captured and the process being clearly set out and followed.

6 Recommendations

No.	Recommendation	Reference	Who	When
2012SAF01	Guidance should be given to ensure that irregular working practices or events, observed on Safety tours or site visits, are reported currently to Control and logged in line with the company Standard.	3.2.6.2	Rod Reid	June 2012
2012SAF02	Issue an updated WSF procedure for Track reflecting the changed requirements	3.2.7.2	Charles Hervey	June 2012
2012SAF03	Clearly define the red zone/green zone indicator definitions and set out clearly the data capture requirements for red zone/green zone including requisite checks.	4.1	Maintenance Director	June 2012
2012SAF04	Ensure that the restructuring of the Safety reporting procedures following the move from London to Milton Keynes maintain the current integrity checks	3.2.1 3.2.2 3.2.3 3.2.6	Rod Reid	Dec 2012

Appendix A

Mandate

Mandate for Independent Report Part A – Data assurance 2011-2012, Q3 Safety Risk

Audit Title:	Data assurance 2011-2012, Q3 Safety Risk
Mandate Ref:	TBC
Document version:	Draft A
Date:	7 October 2011
Draft prepared by:	Chris Fieldsend
Remit prepared by:	Chris Fieldsend
Network Rail reviewer:	Angelique Tjen

Authorisation to proceed

ORR	Chris Fieldsend	
Network Rail	Angelique Tjen	

Purpose

This mandate sets out the scope of work for the Part A Independent Reporter (Arup) to review Network Rail's (NR) safety risk data. As regulated targets, it is critical that ORR has assurance of the quality of this data. ORR particularly needs assurance that RIDDOR reporting is now being accurately recorded for NR contractors & sub-contractors to properly assess NR's full performance against set targets for CP4 ,and that Infrastructure Wrong Side Failures (IWSF), Irregular Working (IW) reporting and Green Zone (GZ) v Red Zone (RZ) working is appropriately and consistently reported by different functions and across the industry to effectively assess NR's safety performance, determine the key risks to the railway and set suitable priorities for inspection and investigation.

Background

Arup last reviewed NR's safety risk data in Q3 (November – February) 2010-2011. The review concluded that national reporting mechanisms are generally using well defined processes for data collation. The confidence grading for Fatality and Weighted Injuries Rate and Accident Frequency Rate did however decrease (from B2 to B3) due to misinterpretation of RIDDOR classification rules.

The 2010-2011 Q3 review also assessed IWSF and IW. Although IWSFs were awarded an A1 there has been a sharp increase recently and different interpretations between disciplines / functions. IW was given a confidence grading of B3 in 2010-2011 owing to the difficulties Network Rail experience in recording all events. Doubts have also been raised about the consistent categorisation of IW.

Scope

This review should assess the accuracy and reliability of the following KPI's:

- Fatality and Weighted Injuries Rate
- Accident Frequency Rate

- Passenger Safety Indicator
- Category 'A' SPADs (signals passed at danger) ranked 20+
- IW
- IWSF
- Route Crimes
- Level Crossing Misuse

The review should:

- comment on the reliability, quality, consistency, completeness and accuracy of the reported data
- present a confidence grade for each KPI and comment upon the direction of travel since last reviewed in Q3 2010-2011
- report on progress against recommendations made in Q3 2010-2011 and make appropriate recommendations where necessary

In addition to reviewing the above KPI's, the review should consider:

- RIDDOR reporting. In assessing progress against last years recommendation, the review should comment on what is being done to address issues [identified in last year's audit] associated with, and improve reporting by labour only suppliers and sub contractors
- Infrastructure Wrong Side Failures – a detailed review of how incidents are classified. The review should outline:
    - How are IWSFs compiled?
    - What systems are used?
    - Who makes the categorisation assessment and provides sign off?
    - What, if anything, has changed since last years data assurance review?
- Irregular Working – a detailed review to determine how consistently incidents are categorised. The review should outline:
    - How different parties categorise incidents
    - What risk is the measure identifying?
    - How can the measure be used by ORR?
    - Near miss / close call data - what is being reported and how is it being used, what intelligence is gained for wider risk control?
- Green Zone v Red Zone working. The review should comment on:
    - The quality of the data
    - What is deemed GZ / RZ?
    - How are individuals working alone classified?
    - How it is being recorded i.e. by hours only or by number of incidents etc
    - Consistency of approach, interpretation and recording across various routes/functions
    - What real intelligence on worker protection and levels of risk are being obtained from it?

Methodology

The Reporter should meet with relevant Network Rail employees to understand any procedural changes [to the processes used to report the above KPIs] since the

Q3 2010-2011 report. The Reporter should also review all relevant documentation and systems, and comment upon their quality and fitness for purpose.

The Reporter should outline their proposed methodology to undertake the detailed reviews of IWSF, IW and GZ / RZ working.

Deliverables

The Reporter should provide a publishable report, including findings, conclusions and recommendations. The report should be prepared in draft form and sent electronically to Network Rail and ORR, at the same time. The Reporter should facilitate feedback (via a tripartite feedback session if appropriate) and provide a revised report with track changes. This should be followed by a final report for publication on ORR's website.

Timescales

A fully costed proposal for this work is required by 14 October 2011. Work is expected to commence shortly after following approval by NR and ORR. A draft report is required by 23 December 2011and a final report is required by 10 February 2012.

Independent Reporter remit proposal

The Independent Reporter shall prepare a fully costed proposal for review and approval by NR and ORR on the basis of this mandate. The approved remit will form part of the mandate and shall be attached to this document. The proposal will detail methodology, tasks, programme, deliverables, resources and costs.

Confidence grades

The Independent Reporter shall provide a confidence grade for each of the measures under investigation. The confidence grading system in Annex A should be used. For each measure, the Independent Reporter should include the:

- confidence grade for this review;
- commentary on direction of travel since last year;
- commentary on this year's grade against ORR's benchmark; and
- an indication of the highest achievable grade for each measure.

Annex A: Confidence grading system

System reliability grading system

System Reliability Band	Description
A	Appropriate, auditable, properly documented, well-defined and written records, reporting arrangements, procedures, investigations and analysis shall be maintained, and consistently applied across Network Rail. Where appropriate the systems used to collect and analyse the data will be automated. The system is regularly reviewed and updated by Network Rail's senior management so that it remains fit for purpose. This includes identifying potential risks that could materially affect the reliability of the system or the accuracy of the data and identifying ways that these risks can be mitigated. The system that is used is recognised as representing best practice and is an effective method of data collation and analysis. If necessary, it also uses appropriate algorithms. The system is resourced by appropriate numbers of effective people who have been appropriately trained. Appropriate contingency plans will also be in place to ensure that if the system fails there is an alternative way of sourcing and processing data to produce appropriate outputs. Appropriate internal verification of the data and the data processing system is carried out and appropriate control systems and governance arrangements are in place. The outputs and any analysis produced by the system are subject to management analysis and challenge. This includes being able to adequately explain variances between expected and actual results, time-series data, targets etc. There may be some negligible shortcomings in the system that would only have a negligible affect on the reliability of the system.
B	As A, but with minor shortcomings in the system. The minor shortcomings would only have a minor effect on the reliability of the system.
C	As A, but with some significant shortcomings in the system. The significant shortcomings would have a significant effect on the reliability of the system.
D	As A, but with some highly significant shortcomings in the system. The highly significant shortcomings would have a highly significant effect on the reliability of the system.

Notes:

1. System reliability is a measure of the overall reliability, quality, robustness and integrity of the system that produces the data.

2. Some examples of the potential shortcomings include old assessment, missing documentation, insufficient internal verification and undocumented reliance on third-party data.

Accuracy grading system

Accuracy Band	Description
1*	Data used to calculate the measure is accurate to within 0.1%
1	Data used to calculate the measure is accurate to within 1%
2	Data used to calculate the measure is accurate to within 5%
3	Data used to calculate the measure is accurate to within 10%
4	Data used to calculate the measure is accurate to within 25%
5	Data used to calculate the measure is accurate to within 50%
6	Data used to calculate the measure is inaccurate by more than 50%
X	Data accuracy cannot be measured

Notes:

1. Accuracy is a measure of the closeness of the data used in the system to the true values.
2. Accuracy is defined at the 95% confidence level - i.e. the true value of 95% of the data points will be in the accuracy bands defined above.

Benchmark grades

As agreed with Network Rail, the Q3 2011-2012 data assurance review will be the first to use this new confidence grading system. A characteristic of the new system is the introduction of a benchmark grade; the grade at which ORR believes the measure should be, given what we know about the processes and level of subjectivity in deriving it. It should be noted that this is the first review in which this benchmark grade has been introduced, and all parties should decide how useful this element is throughout the review. The table below provides ORR's benchmark grades for the Q3 2011-2012 data assurance review of safety risk.

Measure	Benchmark grade
Fatalities and Weighted Injuries Rate	B2
Accident Frequency Rate	B2
Passenger Safety Indicator	B3
Category 'A' SPADs 20+	A1*
Irregular Working	B3
Infrastructure Wrong Side Failures	A2
Route Crime	B3
Level Crossing Misuse	A3
Green Zone V Red Zone working	B3

Appendix B

Glossary

Glossary

AFR	Accident Frequency Rate
AMCC	Asset Management Control Centre
BTP	British Transport Police
COSS	Controller Of Site Safety
Green Zone	Working lineside with no trains operating
GZAC	Green Zone Access planning system
Ellipse system	An integrated asset management and works planning
FWIR	Fatalities and Weighted Injuries Rate
HLOS	High Level Output Statement
IMDM	Infrastructure Maintenance Delivery Manager
IP	Investment Projects
IWA	Individual Working Alone
ORA	Operations Risk Advisors
PIM	Precursor Indicator Model
PSI	Passenger Safety Index
RAM	Route Asset Manager
Red Zone	Lineside working with trains operating
RIDDOR Regulations	Reporting of Injuries, Diseases and Dangerous Occurrences
RSSB	Rail Safety and Standards Board
SINCS	Signalling WSF Database
SEAR	Safety and Environment Assurance Report
SMIS	Safety Management Information System
SPAD	Signal Passed at Danger
SSOW	Safe System of Work
TME	Track Maintenance Engineer
WHSEA	Workforce Health and Safety Advisors
WSF	Wrong Side Failure