Network Rail and
Office of Rail Regulation
Independent Reporter (Part A)
2010/11 Q3 Data Assurance Report

Issue 4 | February 2011

Ove Arup & Partners Ltd
13 Fitzroy Street
London
W1T 4BQ
United Kingdom
www.arup.com

Job number 209830

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Document Verification

ARUP

Job title		Independent Reporter (Part A)		Job number 208930-82
Document title		2010/11 Q3 Data Assurance Report		**File reference**
Document ref				
Revision	**Date**	**Filename**	Q3 Report Issue 1.doc	
Issue 1	10/01/11	**Description**	First draft	
			Prepared by	Checked by	Approved by
		Name	John Armstrong, Phil Dargue, Grant Hainey	Douglas Leeming	Stefan Sanders
Issue 2	07/02/11	**Filename**	Q3 Report Issue 2.doc	
		Description	Revised draft	
			Prepared by	Checked by	Approved by
		Name	John Armstrong, Phil Dargue, Grant Hainey	Douglas Leeming	Stefan Sanders
Issue 3	15/02/11	**Filename**	Q3 Report Issue 3.docx	
		Description	Revised draft following meeting on 11 February 2011	
			Prepared by	Checked by	Approved by
		Name	John Armstrong, Phil Dargue, Grant Hainey	Douglas Leeming	Stefan Sanders
Issue 4	25/02/11	**Filename**	Q3 Report Issue 3.docx	
		Description	Revised following review by Network Rail	
			Prepared by		
		Name	John Armstrong, Phil Dargue, Grant Hainey	Douglas Leeming	Stefan Sanders
		Filename		
		Description		
			Prepared by	Checked by	Approved by
		Name			

Issue Document Verification with Document ✓

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Executive Summary

This report describes the data assurance work that was undertaken during Q3 2010/11. Three prime areas of activity were reviewed during this Quarter covering:

- KPI 1: Safety Risk;
- Infrastructure Condition Reporting and Network Condition Reporting; and
- KPI 6c: Asset Management.

KPI 1: Safety Risk

This work covered the following elements:

- Fatality and Weighted Injuries Rate (FWIR);
- Accident Frequency Rate (AFR); and
- Passenger Safety Indicator (PSI).

In addition, and following discussions with the Office of Rail Regulation and Network Rail, the following items were also reviewed:

- Category 'A' SPADs (signals passed at danger) ranked 20+;
- Irregular working;
- Infrastructure wrong side failures;
- Route crimes; and
- Level crossing misuse.

The conclusion of the review is that the national reporting mechanisms, including the centralised SMIS reporting centre at Milton Keynes, are using well defined processes for the collation and recording of data. These processes, however, rely on accidents and other safety events being accurately recorded and being passed through the systems.

Staff accident reporting is impacted at various levels including the injured person actually reporting it in the first place. The accuracy of data has been adversely affected by misinterpretation of the RIDDOR classification rules. This shortcoming was identified earlier and revisions to the process have been made and, whilst these have strengthened the process, it has inevitably impacted on the confidence ratings for FWIR and AFR.

It should be noted that a separate, more detailed study has been undertaken by RSSB which looked at the cultural and organisational issues associated with compilation of AFR and FWIR. The RSSB report was published in January 2011 and contains more contextual information about the processes described here.

The Confidence Ratings for the elements covered by this workstream are shown in the following paragraphs.

Fatalities and Weighted Injuries Rate (FWIR)

This was rated 'B2' at the previous audit. The accuracy of the FWIR data has been adversely affected by the misinterpretation of the RIDDOR classification rules. This

shortcoming was identified earlier in the year and revisions to the process have been made. Whilst these changes have helped this has inevitably impacted on the rating for this measure. It is however recognised that Network Rail has put in considerable effort to plugging the shortcomings which they themselves highlighted. Given these issues the rating is 'B3'. The revised rating reflects the greater focus of this year's audit on the local reporting arrangements (last year the focus was on the HQ reporting processes).

Accident Frequency Rate (AFR)

This was rated 'B2' at the previous audit. The issues highlighted for FWIR above apply equally to AFR. This has inevitably impacted on the rating for this measure although Network Rail has similarly put in considerable effort to resolving the shortcomings which they themselves identified in the process. Given these issues the appropriate rating is 'B3'. As with FWIR, the revised rating reflects the greater focus of this year's audit on the local reporting arrangements (last year the focus was on the HQ reporting processes).

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 appropriate rating.

Category 'A' SPADs 20+

The measure was rated 'A1' at the last review. This remains a highly documented and controlled process covering a relatively small volume of data with a good set of inbuilt checks. The KPI remains at 'A1'.

Irregular Working

This measure was rated 'B3' at the last review. This report highlighted ongoing difficulties in the recording of all Irregular Working events. This confirmed the findings from last year's higher level review and the rating remains at 'B3'.

Infrastructure Wrong Side Failures

This measure was rated 'A1' at the last review. The measure is currently under review by Network Rail but the overall data set remains small and the rating remains at 'A1'.

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 to compile the data. Crime data, by its very nature, will never capture every event and 'B3' remains the appropriate rating.

Level Crossing Misuse

This measure was rated 'A3' at the last review. The process remains well defined with serious incidents fully recorded. There remains the ongoing issue with near miss reporting never likely to improve beyond its current levels. The rating for this measure remains at 'A3'.

Infrastructure Condition Reporting and Network Condition Reporting

Network Rail produces an Infrastructure Condition Report (ICR) and a Network Condition Report (NCR) every operating period. The NCR is largely a subsection of the ICR and is produced specifically for the ORR and includes a subset of Regulatory Measures. The ICR comprises seven main sections:

- Foreword;
- KPI Summary;
- Asset Stewardship Indicator;
- Asset Condition / Faults;
- Train Performance;
- Targets; and
- Summary of ORR Measures.

Whereas previous reviews of these measures have concentrated on the master database and the computational accuracy of the contents, the work undertaken for this report has focused more on the 'upstream' processes to examine whether the data populating the spreadsheets are consistent and accurate.

The conclusion of the review is that the production of the ICR and NCR from the central ICR database is highly automated and well documented, and is robust and accurate. As noted previously, some of the 'upstream' data sources and collection and refreshment processes are comparatively manual in nature, and are less well-documented and less widely understood.

It would be useful to have a single, controlled specification document available within Network Rail and ORR, setting out the purposes, requirements and methods of preparation of the ICR and NCR, although, this depends upon the outcome of ongoing discussions between Network Rail and the ORR.

Infrastructure Condition Rating / Network Condition Rating

A robust system is in place for producing the periodic ICR and NCR, and the procedures used are automated where possible (although a significant amount of data is copied and pasted in the process). The process is thoroughly documented, with the documentation being updated as necessary to reflect changes that are introduced, as witnessed by this year's review and findings.

The finding of disparate upstream data sources and processes, with varying degrees of automation has resulted in an overall Confidence Rating of 'B2'. This is unchanged from 2009/10. Three individual elements of the ICR and NCR were also reviewed, and received individual Confidence Ratings as follows:

- Good Track Geometry (GTG), 'B2';
- Isolated Rail Defects, 'A2'; and
- Structures Subject to Additional Inspections, 'A2'.

KPI 6c: Asset Management (Station Stewardship Measure (SSM) and Light Maintenance Depot Condition (LMDC)

The last review of these measures led to a considerable amount of debate over the course of 2010 culminating in a meeting in early October 2010 where further information was shared by Network Rail regarding the calculation of the SSM score. The understanding of this allowed a more targeted study to be made on site of the factors directly affecting the SSM. At the same time the Reporter team were able to replicate the algorithm calculation to test the impact any discrepancies at the site level would have on individual station scores. Fifty stations and two depots were subject to site inspection as part of this review.

The result of the audit is that the observed station conditions led to variations in the reported SSM scores ranging from -6% to +25%.

With regard to the Light Maintenance Depot Condition assessments it was observed that OPAS appeared to lack detail for a significant proportion of the facilities. This is understood to be a result of the scoring data pre-dating OPAS. As a result, this restricted the scope of the work in this area meaning that only two substantial depot surveys could be reviewed.

The observed impact on the LMDC measures are variations of +1% and +12%.

Station Stewardship Measure (SSM)

For the Station Stewardship Measure we see that there are sound processes in place to evaluate station condition and these should provide a good set of results on which to evaluate asset condition. The recent documentation of the Network Rail assessment of Asset Life Expectancy has however had an unintended impact on the SSM with elements judged in good order having, in some cases, their ALE increased during the audit with the resulting impact on the SSM.

Given the range of variation the Confidence Rating for the SSM is 'B3'. This represents an improvement in the level of reliability (previously 'C') to reflect the improved processes and greater consistency. The accuracy, given that it is now possible to model the SSM calculation, improves to '3' on the basis of while individual station variations may be significant when averaged; it results in variations of less than 10%.

Light Maintenance Depot Condition (LMDC)

The picture is similar for the LMDC which, despite the lower sample, resulted in variations of up to 12% in the overall facility score. The position with the LMDC was further complicated by the apparent roll-forward of scoring from a previous less detailed methodology for a very significant portion of the population. As a result the LMDC Confidence Rating is put at 'C4'. This was previously 'C5' and reflects the up to 12% variation in the reporting (albeit in a small sample) and the impact of the significant lack of detailed reporting of the asset condition in OPAS for some sites.

1 Introduction

1.1 Background

Arup was appointed by the Office of Rail Regulation 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 2010/2011.

1.2 2010/2011 Q3 Report

This Quarterly Report has been produced in accordance with Mandate AO/003: Data Assurance for Output Monitoring. The KPIs covered in this report are as follows:

- KPI 1 - Safety Risk;
- Infrastructure Condition Report (ICR) and Network Condition Report (NCR); and
- KPI 6(c) - Asset Management (Stations Stewardship).

It should be noted that the originally agreed rolling programme of work included coverage in Q2 of Measure 6(c) Asset Management. However, as a result of on-going discussions regarding this measure during the summer of 2010 it was agreed with Network Rail and ORR that this KPI should be covered in the Q3 report. It is our strong recommendation that the review of this measure should be restored to Quarter 2 in 2011/12 to make the most of available daylight for site visits and to increase the likelihood of clement weather thus reducing the likelihood of abortive costs.

Following this brief introductory section, each of the above KPIs is reported in a separate chapter structured such that they cover:

- Methodology employed;
- Findings obtained;
- General observations made; and
- Conclusions drawn.

The findings are then brought together in a combined presentation of the Confidence Ratings, and any recommendations which have been made.

2 Progress on 2009/10 Recommendations

2.1 Introduction

Following the audits carried out in 2009/10, a series of recommendations were made by the Reporter team and subsequently agreed with both the Office of Rail Regulation and Network Rail. Whilst these are subject to ongoing routine monitoring as part of the Quarterly reporting cycle, the Reporter team reviewed progress in detail with Network Rail in the course of the current audit.

For completeness, the recommendations are set out in full below, along with the progress made since they were agreed

Number	Recommendations	Data Champion	Due Date	Progress	Reporter Team Update
2010.1.1	Network Rail should ensure that planned future automation of currently manual management and transfer of data from SMIS to the SEAR does not degrade or abolish the existing level or standards of check / verification	Rod Reid	July 2010	Network Rail will continue with the existing levels of check/verification. Where changes to SMIS are planned, NR will review the existing levels of check/verification to take account of such changes	Actions now in place and Network Rail need to monitor as part of all future changes. Action Closed
2010.1.2	Network Rail and RSSB should clarify the status and ownership of the SMIS Event Matrix to ensure there is no doubt over responsibility for maintaining and updating this important document.	Rod Reid	May 2010	Network Rail and RSSB both recognise that ownership of a 'document' intended to improve SMIS data quality and consistency best resides with RSSB. Discussions are currently ongoing as to what format that 'document' should take and whether the existing SMIS events matrix is suitable to be widened in scope to cover all railway group members	RSSB has accepted that it is their document. Action Closed
2010.1.3	Network Rail should confirm that the current arrangements for protecting the integrity, consistency and veracity of externally sourced data such as passenger kilometres and contractor hours are adequate and that no additional safeguards are necessary	Rod Reid	May 2010	The Health & Safety systems team with Safety & Compliance have reviewed the current arrangements. It is considered that the current arrangements for protecting the integrity, consistency and veracity of externally sourced data are sufficient, but the team will continue to review the data, on a periodic basis, and challenge any significant variations. Having been advised by the ORR of concerns in respect of potential anomalies and inconsistencies in the recording and reporting of RIDDOR reportable workforce injuries, an internal review of recording and reporting arrangements has been undertaken. This has confirmed that workforce accident figures for 2009/2010 have been adjusted, and a revised set of internal guidelines have been compiled and briefed to relevant line managers, and Network Rail's contractors. This has been done in order to provide consistency when dealing with 'staff returning to work on light duties' and 'pre-existing conditions'. Network Rail Standard NR/L3/INV/0103 'Reporting of Personal Accidents and Assaults to Employees and Contractors' and accident form 2072A have also been appropriately amended, with a compliance date of 1 January 2011. The separate	Specific requirements of the action completed. Issues raised on accident data reporting are highlighted elsewhere in this report. Action Closed

Number	Recommendations	Data Champion	Due Date	Progress	Reporter Team Update
				independent RSSB study has examined this area in much greater detail and the report published in January 2011 contains a number of new, relevant recommendations.	
2010.1.4	Network Rail should correct the normalising anomaly in the instructions for compilation of the Category 'A' SPAD 20+ KPI and ensure the level crossing misuse instructions reflect the separate capture of child fatalities	Rod Reid	March 2010	The normalising anomaly has been corrected, and the level crossing misuse instructions have also been amended to reflect the separate capture of child fatalities. These amendments have been made in the 'Safety Key Performance Indicators Instructions for Compilation for 2009/2010' (Dated 17/03/2010). Note – these instructions have been subject to a further separate review and update, in terms of format and content, for 2010/11 and amendments included in a revised guide issued on 05/08/2010.	The normalising error has been corrected but the level crossing data still does not reflect the requirement to capture child fatalities. Ongoing action
2010.1.5	Network Rail should implement the formal checks of SMIS data in accordance with the line standard	Charlotte Kingdom	February 2010	The formal checks of the SMIS data, in accordance with the line standard, are now being undertaken by the Safety Reporting Manager's team.	Evidence of SMIS audits seen by Reporter Team. Action closed
2010. NCR.1	ORR and NR to discuss ORR's requirements for asset reporting.	Mary Jordan	March 2010	A meeting was held between ORR and Network Rail at ORR's offices on 16/3/10. Network Rail proposed that the courtesy copy of the ICR to the ORR cease with effect from 2010/11 reporting and that any essential information be reported on a formally agreed basis via the electronic data store.	Partially complete – awaiting final agreement of arrangements
2010. NCR.2	Correct minor documentation/highlighting and formatting issues in ICR spreadsheets	Mary Jordan	March 2010	As noted in section 5 of this report, this recommendation has been implemented in full.	Action closed
2010.6.1	The construction of the SSM and LMDC should be reviewed, with the aim of making them more meaningful such that they can be used as the basis for investment	John Chappell	September 2011	Recommendation accepted by Network Rail with work meetings planned to review the measure. Considered a CP5 issue.	Action ongoing

Number	Recommendations	Data Champion	Due Date	Progress	Reporter Team Update
	decisions avoiding minute changes in the scores for considerable investment levels.				
2010.6.2	A greater level of consistency should be ensured throughout the survey teams (by means of common standards of training etc.) to ensure that the level of detail is consistent nationally	John Chappell	March 2011	The variation in the level of detail applied in the surveys is now understood to be as a result of the 'ADC lite' process adopted at the start of quinquenial survey regime. With this understanding the recent round of surveys have focussed on the approach to the surveys which have been found to be broadly similar and helped with the issue of the latest guidance notes.	Significant progress made with SSM Action closed
2010.6.3	A greater level of consistency should be ensured throughout the survey teams (again by means of common standards of training etc.) to ensure that the approach to remaining life is consistent nationally	John Chappell	March 2011	Network Rail has recently issued a more detailed version of the guidance notes for assessment of SSM and this has included a comprehensive statement of Asset Life Expectancy (ALE). It is believed that this new document will bring about greater consistency.	Significant progress made with SSM Action closed
2010.6.4	Network Rail's high level of survey audit activities should be continued until Amey's survey outputs stabilise at consistently satisfactory level.	John Chappell	To be continued until consistency is achieved	This recommendation was accepted by Network Rail. The accuracy of the Amey surveys is regularly audited as part of the data quality assurance process.	Action closed
2010.6.5	Although ORR does not favour the re-surveying of stations and depots when significant investment has been made on site (to ensure that an accurate 'snapshot' of asset condition at a given point in time is maintained), consideration should be given as	John Chappell	March 2011	This was accepted by Network Rail. A strategic review of the KPIs is to be undertaken	Action ongoing

Number	Recommendations	Data Champion	Due Date	Progress	Reporter Team Update
	to how such ongoing improvements should best be recorded and reflected				
2010.6.6	The survey acceptance process should be amended so that uploaded surveys are not automatically accepted 'by default'	John Chappell	March 2011	The circumstances leading to the drafting of this recommendation have been explained and there is a now a better understanding of how the process works such that we believe that this is no longer an issue worth of further pursuit.	Action closed
2010.6.7	The process documentation should be expanded to include details of the calculations used to produce the measures – a separate, specific document should be produced for this purpose, referenced from the higher-level Definition and Procedures documents.	John Chappell	March 2011	This was accepted by Network Rail and a document, see 2010.6.3 above, has been issued to provide this detail.	Action closed

Table 2.1: Recommendations Progress Review

3 KPI 1: Safety Risk

3.1 Introduction

The safety KPIs were last audited in Q3 2009/10. That audit focused primarily on the national collation processes involved in producing the Safety KPIs within the Safety and Environment Assurance Report (SEAR). It did not look at any of the localised data collation processes. As a result, the Reporter Team were requested that this review should concentrate on examining the effectiveness of the reporting and recording of safety events at local level. It was agreed that particular focus should be put on staff accident reporting as measured within the Fatality Weighted Index (FWI) and Accident Frequency Rate (AFR).

It should be noted that a separate, more detailed study was undertaken by RSSB which looked at the cultural and organisational issues around which AFR and FWIR are compiled. This report, "Independent Review of RIDDOR Reporting by Network Rail and its Contractors" was published in January 2011. It focuses in particular on RIDDOR reporting and contains more contextual information about the processes described in this report.

This audit has, covered all the KPIs reviewed last year but not all measures have been covered to the same depth. In particular, the reporting of Infrastructure Wrong Side Failures has not been reviewed during this audit; however it has been included in this report for completeness. In all cases the Reporter Team sought to identify any changes to the process since the last review and to understand the impact these may have had on the individual Confidence Ratings.

It is recommended that any areas not covered fully during this audit should be reviewed in 2011/12.

The safety targets, defined by the CP4 determination, are for a 3% reduction in the risk of death or injury from accidents on the railway for passengers or rail workers. Since these are industry targets they do not form a regulated output in themselves, and are therefore not a specific KPI against which Network Rail is measured.

This report reviews the following KPIs which are the same as the previous year:

- Fatality and Weighted Injuries Rate (FWIR);
- Accident Frequency Rate (AFR); and
- Passenger Safety Indicator (PSI).

It also covers the following additional Measures:

- Category 'A' Signals Passed at Danger (SPADs) Ranked 20+;
- Irregular Working;
- Infrastructure Wrong Side Failures;
- Route Crime; and
- Level Crossing Misuse.

The definitions of most of these indicators are set out in the Network Rail document 'Safety Key Performance Indicators - Instructions for Compilation 2010/11'. The document is reviewed annually and is re-issued every year. The current definitions and purpose of the reviewed KPIs are reproduced below.

3.2 Audit Methodology

The Reporter Team had an initial discussion with the Network Rail Data Champion, the Head of Health and Safety Systems, on the 7th October 2010 to discuss the approach to carrying out this year's review. Following this discussion an outline programme was produced and issued to both Network Rail and ORR for discussion. A further meeting was then held with ORR on the 1st November to discuss the approach and to clarify their requirements.

Following this a further formal meeting was held with the Head of Health and Safety Systems on the 2nd November to confirm the arrangements and identify the relevant managers within the organisation to be interviewed to obtain relevant evidence. As a result the following meetings were held:

Date	Network Rail Attendees	Location
15th November	Network Rail Safety Improvement Specialist, Maintenance	40 Melton St, London
15th November	Principal Assurance Specialist I.P. Assurance Specialist (Reporting) I.P. Assurance Assistant (Reporting) I.P.	Mailbox, Birmingham
22nd November	Head of Health, Safety, Environment and Assurance, Enhancements	40 Melton St, London
22nd November	Head of Health, Safety, Environment & Assurance, Track	40 Melton St, London
25th November	Workforce Health, Safety & Environment Advisor (Sussex Route) Workforce Health, Safety & Environment Advisor (Brighton Delivery Unit) Workforce Health, Safety & Environment Advisor (Croydon Delivery Unit)	Carolyn House, Croydon
1st December	Professional Head of Safety, Rail, Carillion Infrastructure	SBQ3 Smallbrook, Queensway, Birmingham
2nd December	Workforce Health, Safety & Environment Advisor (Scotland Route) Workforce Health, Safety & Environment Advisor (Glasgow Delivery Unit) Workforce Health, Safety & Environment Advisor (Edinburgh Delivery Unit)	Motherwell Depot
6th December	Safety Reporting Manager	Milton Keynes
7th December	Workforce Health, Safety & Environment Advisor (LNW South) Workforce Health, Safety & Environment Advisor (Stafford Delivery Unit) Workforce Health, Safety & Environment Advisor (Bletchley Delivery Unit)	Stafford Depot
9th December	Safety and Assurance Director, Balfour Beatty Rail. SHEQ Manager, Balfour Beatty Rail SHEQ Advisor, Balfour Beatty Rail Plant	Balfour Beatty Rail HQ, Redhill, Surrey

10th December	Safety Management System Specialist	York Place, London

Table 3.1: Meeting Schedule

At these meetings the Reporter Team reviewed the respective roles in the production of the KPI, studied the documented procedures, reviewed any systems in use, and looked for detailed evidence to support the work undertaken. Where practical, actual data was requested to check that the reporting processes were accurately passing through the various reporting layers before being published within the SEAR. In this regard the Reporter Team reviewed sample data for Periods 5, 6 and 7 in detail.

3.3 Audit Findings

3.3.1 Fatalities and Weighted Injuries Rate (FWIR) & Accident Frequency Rate (AFR)

3.3.1.1 Definition

Fatalities and Weighted Injuries Rate (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. Comprising of those defined as reportable under RIDDOR 95, as well as those which are not reportable, normalised per 1,000,000 hours worked.

Accident Frequency Rate (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. Comprising of those defined as reportable under RIDDOR 95, normalised per 100,000 hours worked.

3.3.1.2 Reliability - Process and Procedures

The above KPIs use broadly the same base data but are calculated differently. It is therefore appropriate to review both together. The main difference in data is that FWIR includes “no lost time” accidents whilst AFR does not. Network Rail compiles staff accident data for all personnel engaged in work on Network Rail sites (with a couple of specific exclusions, the management centre at Westwood and the apprenticeship training centre in Gosport). This includes all Network Rail staff and any contractors working on their behalf.

The general accident reporting requirements are set out in a Level 3 Standard, NR/L3/INV/0103 'Reporting of Personal Accidents and Assaults to Employers and Contractors'. The current version is dated 4 September 2010 but a revised version was issued on the 4 December 2010. Within the major Network Rail departments specific processes have been set up to collate this information and in particular the Reporter Team looked at Maintenance, Investment Projects, and Operations and Customer Services. Each of these is considered below.

Maintenance

The vast majority of maintenance work is now done by in-house staff. However, the formal reporting requirements are the same for any Contractor employees.

In all cases the Injured Person is required to inform the relevant Control Office that they have had an accident. This is either done by the injured person themselves, or through their line manager. On receipt of the information the Controller will record the data. There is no standard format for Controllers to do this. In the course of the review three Routes were visited. It was noted that each Control had developed their own computerised form to record the data. It is felt that standardising this, either in Control Centre Integrated Log (CCIL) format or other appropriate ways, should be considered.

Once reported the Control will then contact relevant managers such as the Infrastructure Maintenance Delivery Manager (IMDM) and the Workforce Health, Safety and Environment Advisor (WHSEA). However, the exact arrangements of who to call and what happens next vary by Route. In Scotland, for instance, the on call manager is expected to attend any accident that could potentially be a RIDDOR or lost time accident to ensure a proper investigation is started and relevant individuals interviewed promptly. This requirement is not, however, included in any formalised or documented procedures.

Evidence was provided on the Routes visited of regular briefings given to staff on how to report accidents. As an example on Sussex Route a simple flow chart is displayed at all local signing in points.

Accident Books are no longer maintained at any depots. An "All Accident Register" is compiled by the Safety Improvement Specialist within the national maintenance team in London. The data within this register is compiled from data supplied by the Route WHSEAs. Each of the Route teams keeps a spreadsheet record of all staff accidents. This is normally on a shared drive which they can all access and update. This register is supplied to the Safety Improvement Specialist on a periodic basis. The national All Accident Register is then checked against SMIS and supplied to the Safety Information Manager for inclusion in the SEAR data.

The Level 3 standard, NR/L3/INV/0103 'Reporting of Personal Accidents and Assaults to Employers and Contractors' specifies the completion of standard accident reporting forms. There are two forms, 2072A is the initial form. Part 1 of the 2072A is completed as soon as possible after the accident by the injured person and their line manager must complete part 2 within 5 working days. A more detailed form, 2072B is required to be completed for all non minor accidents once the investigation into the cause is completed. The flowchart from the Standard summarising the requirements is included in Appendix D.

During the review inconsistencies were found during the Route visits in the completion of the 2072 forms. In some cases the 2072A was not completed at all and only the detailed form 2072B was used. In other cases the latter form is only completed for serious incidents. We believe that these process anomalies should be fully rectified. This is particularly important since a recent change to include the total number of work days lost as a result of the accident has been added to the initial form (2072A) only.

In addition to the requirements of NR/L3/INV/0103, the Maintenance team has put in place an additional requirement that all significant accidents are subject to a Serious Incident Alert (SIA) which must be completed by a WHSEA. This process was originally created to provide "flash" information to senior management on accidents but has become a major part of the maintenance reporting process. However, the requirement is not documented and there is no clear definition of when they should occur, with each Route having a slightly different understanding and adopting a slightly different approach. Whilst the quality of many of the SIAs is very good, it has become a parallel process to the formal investigation and reporting procedures in NR/L3/INV/0103. As such it is seen by some of the WHSEAs as an unnecessary distraction to the smooth running of the formal process. The recent inclusion of SIAs as a measure within the 'Safety Scorecard' is seen as encouraging them to be completed merely to gain points and actually rewards accidents, since a nil accident return would equal nil investigation points.

The reporting of minor, "no lost time" accidents showed differing trends on the Routes visited. Some showed increases which were seen as possible evidence of better reporting, whilst on others there were unexplained falls. It is therefore difficult to make definite conclusions on the comprehensiveness of the capture of minor accidents. It is unlikely that the Maintenance team will capture 100% of these given the nature of the rail environment and a natural reluctance to report minor accidents. However, the Reporter Team saw evidence of considerable efforts to encourage staff to report all accidents through briefings. These included reconstructions on LNW South which are filmed and played at staff safety briefings. These efforts are now focusing more and more on events that could have led to accidents (the use of "near miss" is precluded because of its industry meaning of involving trains). A similar programme is discussed within the Infrastructure Projects section.

Lost time and RIDDOR Major Accidents are far more likely to be identified from the outset and receive a higher level of investigation and scrutiny. However, there have been issues within Maintenance on the correct interpretation of the RIDDOR classifications which has led to an under-reporting of RIDDOR Major Accidents. These have been down to three areas of interpretation.

- Staff returning to work but not capable of carrying out their full duties. In some cases if an injured person returns to work but was put onto non-manual duties (e.g. being a lookout) this was not always shown as a 3+ days lost time incident.
- The actual interpretation of 3+ days was not consistently applied in terms of how to count rest days, weekends or the day of the accident itself.
- There was misinterpretation of how to deal with accidents to staff that had pre-existing conditions which were aggravated by an accident at work. In

all there were twenty-four accidents identified that were not correctly classified as RIDDOR reportable.

As a result of these variations a briefing note was produced by the Head of Health and Safety Systems in June 2010 and issued to all departments giving advice on the categorisation of accidents. This was briefed out to all the managers and evidence of it being included in cascade briefings was seen in the Route / Delivery Unit visits.

As already stated the use of contractors is now at a relatively low level. In the main they are used to supplement staff numbers and work under the direct supervision of Network Rail staff. However, some contractors provide specialist work such as tree felling. In all cases they are expected to follow the standard reporting process used for Network Rail staff and the accidents are counted in an identical fashion. The contracts which were reviewed reinforce this requirement and on one Route evidence was seen of briefing materials highlighting these points. It was not clear, however, whether regular ongoing reminders were given to contractors everywhere. This is particularly relevant since some contracts have been in place for a number of years and staff may well have changed. Network Rail should ensure that all contractors are fully aware of the reporting requirements and the interpretation note issued in June 2010. This issue has been highlighted within the RSSB report.

On the Routes visited very few contractor accidents had been reported this year but there is no evidence to suggest any under-reporting.

The Routes WHSEAs also collate the working hours data which is used to normalise the FWIR and AFR measures. The method of calculating working hours is contained in 'Safety Key Performance Indicators, Guidance for Compilation 2010/2011'. This states that actual contractor hours should be used, but for Network Rail maintenance staff the headcount for the period should be multiplied by 48 to give an average normaliser. The three Routes visited all provided actual contractor hours data, which were verified against the commercial settlement. However, whilst two Routes applied the headcount multiplier correctly for in-house staff, the third Route reported actual hours to Maintenance HQ and seemed unaware of the documented requirement. A check should be carried out to confirm if this is a one-off or whether other Routes are also reporting incorrectly.

Investment Projects / Asset Management

The vast majority of work carried out by Investment Projects / Asset Management (IP/AM) is done by Contractors. Whilst Investment Projects and Asset Management are separate teams they both report in the same way and use a single collation point in Birmingham to report their safety data to the SEAR.

All of the IP/AM data is reported to the Programme Controller (Business Information) team based in Birmingham. The group responsible for collating the safety data is led by the Assurance Specialist (Reporting). They compile all the data received from the programme safety teams and send the compiled data each period to the Safety Information Manager in London.

Each of the programme teams (five within Investment Projects and three in Asset Management) are responsible for collating and managing their own safety data. This is led by the Head of Health, Safety, Environment and Assurance within each

programme. To undertake sample checks the Reporter Team visited the respective safety heads in Enhancements (within Investment Projects), and Track (within Asset Management).

Enhancements have a very wide portfolio of work, much of which is removed from the immediate operational railway. The contracting strategy developed recently has been to contract with a smaller number of multi-functional contractors (currently twelve) capable of carrying out the majority of the work managed by Enhancements (it is currently managing around £1bn worth of work).

A standard method of accident reporting is applied to all contractors. This is specified in the contract and a standard project start up agenda reinforces the requirement to report all accidents / safety events to Network Rail.

The national track renewals programme covers the UK and has four out bases managing the detailed programme. Each of these has an HSEA specialist. The work is now undertaken nationally by three primary contractors, Balfour Beatty, Amey-Colas, and Babcock Rail.

In both programmes all accidents must be reported to the Infrastructure Group Control which is in Milton Keynes. This is a 24 hour national Control Centre which monitors all IP/AM work. The Programme HSEAs monitor the Infrastructure Group Control (IGC) log to pick up accidents as well as the Track team monitoring the contractors' logs.

The Safety Reporting Team in Milton Keynes also monitor the IGC log and will chase up accidents with the relevant Project HSEA to ensure the correct documentation is submitted by the investigating team to enable the accident to be recorded correctly.

To understand the process from inside a contractor's organisation, the Reporter Team visited two large contractors - Balfour Beatty (for track), and Carillion (for enhancement projects). In both cases these organisations has in place sophisticated internal arrangements for capturing accident data.

As large organisations, they have large client lists, all of whom have different reporting requirements which have to be managed alongside their own responsibilities. Both contractors have developed their own centralised reporting arrangements where all accidents, regardless of client, must be reported. Carillion have a system called 'AIRline' which is managed from a centralised reporting centre based in Sheffield. Balfour Beatty uses a software system called 'Tr@ction'.

Whilst there are inevitable differences between contractors, in both cases staff must report accidents to the relevant central reporting office which will then contact the IGC to report the accident in accordance with Network Rail's requirements. This is designed to ensure that any of their employees have one process to follow regardless of which Network Rail client, or other non-rail client, they are working for.

Once the IGC has been informed of an accident the project on-call processes will be invoked to ensure that an investigation is undertaken. In most cases the use of the Network Rail 2072 forms is enforced, but this is not universal. There are also differences in the focus of investigations with one team making the Principal Contractor the lead focus of investigations whilst the other will take more of a

lead themselves. The Contractors adjust their response to take account of these differences. A more standardised approach would assist contractors in knowing how to respond.

An exercise has been undertaken recently across IP/AM to review the RIDDOR classification of staff accidents following the review held for the Maintenance team. All accidents that may have been potentially RIDDOR reportable were identified over the last five years. As part of this exercise Carillion reviewed around sixty accidents. Of these three were re-classified as RIDDOR reportable as a result of the review. Another four accidents that Carillion had reported correctly as RIDDOR accidents had not been correctly classified by Network Rail with the reasons for this not being readily apparent. Balfour Beatty identified two accidents that were reported correctly to ORR but not to Network Rail.

Following this review the checking procedures have been tightened. There is now an increased level of check carried out between the Milton Keynes Safety Reporting team, the Birmingham Assurance team, and the Project Safety teams to ensure that all accidents are correctly recorded and classified. A spreadsheet with all the IGC accident records has been used for around eighteen months but a weekly reconciliation check has been implemented by Network Rail to prevent future problems arising.

One issue highlighted by the contractor visits is the complexity that Network Rail's reporting imposes on them. By reporting against individual projects the contractors have to cut across their own arrangements and report in a different form. Both Contractors understood and fully accepted the rationale behind Network Rail's reporting requirements, but this inevitably creates complexity for them. It may be sensible for Network Rail to discuss with its main contractors what the most effective reporting process for both sides is.

Working hour data is provided by all contractors to Network Rail and is verified against the commercial settlement process. These are the actual hours worked as required by the procedure.

Operations and Customer Services

All OCS staff that have an accident on duty are required to report it to the relevant Route Control. The Route Controls will complete the same process described earlier for Maintenance staff and inform the relevant line manager. No separate Accident Books are kept and SMIS is the only data source for OCS accidents. Local managers keep their own records but these are not compiled to create the SEAR data.

Investigations are undertaken by the relevant line manager with the 2072 forms completed and submitted to the Safety Reporting Team in Milton Keynes for input to SMIS. The Operations Risk Advisors may offer assistance to the line managers but do not generally become involved in this process.

The OCS accident data is submitted to the Safety Information Manager on a periodic basis broken down by Route and Area. It should be noted that the number of OCS accidents is very low.

Checks on accident data for the RIDDOR classification did not identify any that had been wrongly classified.

3.3.1.3 Data Accuracy

To carry out detailed checks the Reporter Team took a vertical slice through the organisation to confirm that accidents are reported consistently through the various layers in line with the process requirements.

In the Maintenance team checks have been made that the accidents on the three Routes visited have been accurately reported through the system for Periods 5, 6 and 7. These checks found that each accident recorded on Sussex, Scotland and LNW South were correctly reported through into the Maintenance All Accident Register and were recorded correctly in the SEAR. A further check was undertaken to confirm that every Maintenance accident recorded on the All Accident Register was recorded in the SEAR for the relevant sample period. These records were found to be fully aligned.

The checks carried out on the Investment Projects / Asset Management accident data did highlight some differences. The data for the Track team for Periods 5, 6 and 7 was all found to be accurately reported from the programme records into the consolidated data collated by the Birmingham Assurance team.

When the same checks were done for the Enhancements team the data for minor accidents differed between the results held by the team and the Birmingham Data. RIDDOR reportable incidents were however all correct. The Enhancement discrepancies are shown below:

Period	Enhancement Data	Birmingham Data
Period 5	11	9
Period 6	14	16
Period 7	10	12

Table 3.2: Enhancement Projects Data Discrepancies

The reasons for the discrepancies were queried with the Birmingham team. It was stated that often accidents can be reallocated across different assets and the data team within Enhancements can be unaware that this has happened. It is clear that whilst all the RIDDOR reportable accidents are tracked consistently this is not the case for more minor events and from the checks carried out whether all the changes were balanced fully across the Infrastructure Projects data.

Operations and Customer Services accident data are entirely sourced from SMIS data. The numbers involve are very small but the checks confirm the SEAR records match those in SMIS.

3.3.2 Passenger Safety Index

3.3.2.1 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.

3.3.2.2 Reliability - Process and Procedures

The procedures for compilation of the PSI remain largely unchanged since the previous audit. It still uses the Train Accident Precursor Indicator Model (PIM) to calculate the national risk to passengers whilst travelling on trains. This data is updated on a quarterly basis and has been recently recalibrated. This model has not been subject to audit as part of this review.

The remainder of the PSI is drawn from actual non-train passenger accident data at Network Rail managed stations and station level crossings. It does not include passenger, trespasser or suicide statistics. The main source of this data is from managed stations which are responsible for investigating all accidents on their premises. Accidents are recorded and input into SMIS in Milton Keynes. Each of the major stations sends a copy of their records on a regular basis to Milton Keynes so that the safety reporting team can clarify that the numbers recorded in SMIS are correct. The records in SMIS are collated together and sent each period to the Safety Information Manager for inclusion in the PSI KPI.

The reporting of accidents to passengers at stations is always unlikely to capture every event. The willingness of passengers to report an incident will depend on severity, whether they feel they have the time to report, or if they are likely to make a claim. It is probably unrealistic to ever expect this to reach 100% reporting of accidents. However, since PSI is weighted the more serious events, especially fatalities and RIDDOR Majors, are always likely to be known. The less serious accidents have a much lower impact on the KPI. No visits to Network Rail managed stations were undertaken during this review due to time constraints. It is suggested that these will take place during the next round of audits.

Normalising data (per 1,000 passenger miles) is provided by ATOC from PALADIN data. The supply of this data has been reviewed by Network Rail following a recommendation from the last audit. The review concluded that the arrangements for protecting the integrity, consistency and accuracy of the data are sufficient and that the ATOC procedures for the publication of this data are robust. The data is used by ATOC for a variety of purposes in publishing its own data as well as being provided to Network Rail.

3.3.2.3 Data Accuracy

The source data for the passenger accident statistics within the KPI is sourced from SMIS. The data for Periods 5, 6 and 7 were supplied and checked against the data table for the SEAR report. The data was all accurately recorded and the calculations were completed correctly.

The PIM data, which is added to the passenger accident data, was not checked as part of this audit but the output from the model were reported correctly within the PSI measure as published in the SEAR.

3.3.3 Category 'A' SPADs 20+

3.3.3.1 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.

3.3.3.2 Reliability - Process and Procedures

All SPADs are reported in real time to Controls and managed in accordance with the Group Standard GO RT3119 Accident / Incident Investigation. Once a SPAD has occurred the investigation requires the completion of forms RT3119 A and B which include the risk ranking. Only those events scoring greater than 20 in the risk ranking process are included in this KPI. However, all Category 'A' SPADs are recorded.

The data is recorded in SMIS and supplied by the Safety Reporting Team on a periodic basis to the Safety Data Processor in Safety and Compliance. This is checked against a detailed spreadsheet which tracks every 20+ Cat 'A' SPAD to ensure they are closed out correctly. The audit also reviewed the risk rankings for consistency.

The dataset for this KPI is quite small and a considerable focus is placed on every event given the profile and potential of serious SPADs to cause major safety incidents. This is a very detailed process given its serious nature that remains unchanged from last year.

3.3.3.3 Data Accuracy

The reported KPIs were checked against the records in SMIS for Cat. 'A' SPADs ranked 20+. This was done using the databases supplied by the Safety Reporting Team to the Safety Information Manager in the Safety and Compliance Team. The figures for Periods 5, 6 and 7 matched. There were no recorded instances in Period 5 and 6 and two instances reported in Period 7. Further checks on the data since the beginning of 2010/11 also revealed no discrepancies.

3.3.4 Irregular Working

3.3.4.1 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."

3.3.4.2 Reliability - Process and Procedures

The requirement to report irregular working is set out in a Level 3 Standard, NR/L3/IWV/0110, 'Irregular Working - Reporting and Risk Ranking'. This has been recently re-issued with a compliance date of 4th December 2010. This can involve events across the key delivery functions including Operations, Infrastructure Projects, Maintenance and the National Delivery Service.

The Standard requires all instances of irregular working to be reported to the appropriate Route Control who should then record them against the appropriate department. However, there are instances where irregular working on Investment Project worksites is only recorded in the Infrastructure Group Control log. This is usually when there is no impact on the operational railway.

The requirement for contractors to report irregular working events is usually emphasised at the same time as staff accidents, e.g. at project start up meetings. Contractors do not always recognise the term 'Irregular Working', which has close association with train operating rules, and is a less well understood concept in the construction industry. The contractors interviewed did, however, have procedures for identifying, capturing and reporting 'potential events. There is a need to define better criteria for the non train operating / rules based infringements within the Standard so that contractors have a much clearer understanding of what irregular working is and how they need to align their own reporting requirements.

When the Route Control becomes aware of irregular working events they will usually request on site attendance to carry out an investigation. In all cases a Designated Competent Person (DCP) will be appointed to ensure a thorough investigation is carried out. In the case of the Maintenance team the DCP will always be the local IMDM but usually the investigation will be carried out by the WHSEA. Within O&CS the DCP is usually the Local Operations Manager with the investigation undertaken by the Risk Control Co-ordinators. Within Infrastructure Projects it is the responsibility of the HSEAs to ensure the investigations are completed.

As part of the investigation, the event must be risk ranked. The KPI records those that are classified as Potentially Significant, and Potentially Severe.

The identification of irregular working is not as precise as staff accidents, and some of the Maintenance WHSEAs said that it will not always be clear from the

first alerts from Route Control that they were dealing with an irregular working event. This sometimes delays the investigation. It was suggested that any page / alert should always contain the phase Irregular Working and this is supported by the Reporter Team.

The SMIS team pick up items of irregular working when they are checking the logs at which point they are input into SMIS. A separate process has been put in place to ensure they are followed up. A spreadsheet is maintained by the Safety Data Processor in Safety and Compliance of all irregular working events showing progress in completing the risk ranking and closing down incidents. This is sent to all the managers responsible for investigating incidents. This process was demonstrated in Scotland, for instance, where the WHSEAs were following up regular requests for data. The recorded rankings are regularly checked by the Head of Health and Safety Systems for consistency and referred back to the relevant manager if he is unsatisfied with the quality of the investigation.

This process was created as a temporary fix to improve data quality, but has been retained because of its positive impact. However, there have been instances when the spreadsheet process has been updated without informing the SMIS team which is probably an inevitable consequence of a parallel process. The process should be reviewed to examine how the duplication can be removed.

3.3.4.3 Data Accuracy

The data used in the SEAR is sourced from the spreadsheet maintained by the Safety Data Processor in the Safety and Compliance team based in York Place, London. A comparison was undertaken between this spreadsheet and the SEAR data to check for any anomalies for Periods 5, 6 and 7.

The checks showed that the incidents of potentially severe, or potentially significant, irregular working that were recorded through the spreadsheet were the same as those reported in the SEAR data. Therefore once an incidence of irregular working has been identified and ranked as potentially severe or potentially significant they are being reported accurately.

3.3.5 Infrastructure Wrong Side Failures

3.3.5.1 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.

3.3.5.2 Reliability - Process and Procedures

The Reporter Team has not reviewed this KPI in detail as part of the 2010/11 Q3 audit. This is because the processes currently in use have been reviewed by

Network Rail and changes are proposed. This is primarily because of differences in the application of the rankings across different disciplines.

It is recommended that this KPI is included in next year's review, to give an opportunity to audit the new procedure.

3.3.6 Route Crime

3.3.6.1 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 Rails 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.

3.3.6.2 Process and Procedures

The data collection processes remain unchanged from the last audit. Data is collated from a variety of different sources including SMIS, Train Operating Companies, and British Transport Police logs. The data collection of this KPI has not been covered in detail by this audit.

3.3.6.3 Data Accuracy

The SEAR data was checked against the SMIS generated data. This revealed a minor difference between the totals provided by the team in Milton Keynes and the published numbers. These were:

Period	SMIS Record	SEAR
Period 5	490	500
Period 6	399	407
Period 7	421	440

Table 3.3: Route Crime Data Counts

The differences were queried with the Safety Information Manager. The explanation is that, at present, the SEAR numbers include the data for HS1 but these are not reported into SMIS. The records for HS1 are currently entered in the "other" category in the SEAR numbers.

3.3.7 Level Crossing Misuse

3.3.7.1 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'

3.3.7.2 Process and Procedures

All of the data provided for level crossing misuse is sourced from SMIS data. Incidents are recorded via Route Control offices and investigated by local operations teams. The Standard requires all events to be fully investigated and the data is input into SMIS by the team in Milton Keynes. The definitions of the various level crossing misuse categories are set out in the document, 'Safety Key Performance Indicators, Guidance for Compilation 2010 / 2011'. However, the Guidance still does not define a child fatality which was a recommendation from the last audit, (though it was stated that this had been rectified). The data is being collected and reported but this minor anomaly should be corrected.

The overall definitions of pedestrians being struck are also a little misleading. This category actually means pedestrians fatally injured. Pedestrians who survive coming into contact with a train are actually categorised within near misses. This should be reviewed to ensure any users of the data have clarity about what the data represents. This is not made clear in the SEAR report itself. These definition issues do not impact on the reliability of the data collection processes but they should be reviewed and reissued.

3.3.7.3 Data Accuracy

The SEAR data for Periods 5, 6 and 7 was checked against the source data recorded by the SMIS team in Milton Keynes. The checks showed that the data was accurately translated into the SEAR apart from one variation in Period 5. Further investigation showed this to be a fatality at Enfield Lock involving a member of the public being pursued by police. The incident was initially categorised as a trespasser fatality but following a discussion between the Safety Information Manager and the SMIS section leader this was re-classified as a level crossing fatality. This is part of the standard checking / challenge process that is built in to the SEAR process.

3.4 General Observations

- The reporting and recording of staff accidents inevitably involves a large number of people, in a wide variety of organisations and a series of judgements applied at all levels. It is inevitable that on occasions this will lead to errors. Network Rail's own review of its accident reporting data has shown that a small but significant number of accidents were incorrectly classified against RIDDOR.
- The main issues were in Maintenance, and Investment Projects. In the case of the former this generally applied to judgement calls over whether an accident counted as a 3+ day accident. Within Infrastructure Projects similar problems applied but evidence was also seen of contractor accidents that were correctly notified to ORR but were not in the Network Rail statistics. As a result Network Rail has briefed out stronger and more precise guidelines on classification, has amended the procedure, and imposed additional checks in Investment Projects to help prevent future occurrences.
- Consideration should be given to increasing the levels of internal verification of accidents, particularly in maintenance where the current regimes do not challenge the classification used by the local team.
- It is unlikely that minor accident reporting will ever be at 100%. However, considerable effort to improve reporting levels was evident during all of the visits. The increased focus on "close call" events, where no injury or loss was caused, is a commendable objective. However, each department, and particularly contractors, are setting up their own initiatives and the opportunity for a standard approach should be considered.
- The use of the 2072 forms is not standard across Network Rail. Guidance should be given to managers as to when each of the forms should be used and the quality of information supplied.
- In a number of areas parallel processes have arisen in an attempt to fill perceived gaps in the formal procedures. One example of this is the undocumented SIA process in the Maintenance team. This requires a second investigation which, whilst often producing good quality reports, duplicates the formal process. A review should be undertaken of the value of the SIA process and adapt the Line Standard process if necessary to include it. There should be a single process.
- If there is a skill gap in the ability of line managers to competently investigate accidents this should be identified and training given. The Reporter Team were told that a national programme is planned within Maintenance.
- Within Maintenance the Reporter Team saw many examples of locally developed good practices to improve safety performance. In general, these are undocumented and not shared with other Route teams. An example is the use of reconstructions for every reported accident on LNW South. There should be a review of these practices and the development of a more documented, standard approach based on developing the best of these arrangements.

- The contractors visited by the Reporter Team have developed sophisticated and well organised processes for accident reporting designed to cope with their wide client base. Network Rail may well benefit by looking at any lessons that can be learnt.
- The suggested working group to look into how contractor reporting should be managed – to the benefit of both organisations - should be convened as soon as practicable to consider exactly how and what should be reported through the Network Rail systems.
- The Reporter Team saw little evidence of internal audit or verification of accident reports. The recent review led by the Head of Health and Safety Systems demonstrated the weaknesses of this process and Network Rail should put in place regular sampling checks to satisfy itself that accidents are being properly recorded, investigated and categorised.
- Network Rail is increasingly focussing on FWIR as a more consistent measure of staff safety performance. However, contractors still focus more on AFR since this measure is in wider use in other industries.
- The reporting of 'irregular working' has many parallels to accident reporting. However, deciding that an event constitutes irregular working relies on a higher degree of judgement since it is based on recognition that a rule or process has been contravened.
- The contractors interviewed by the Reporter Team did not have a strong grasp of the Network Rail definitions of 'irregular working' within their own processes. The links to their own near miss arrangements are not as clear as they could be and a review of the application of the Standard in the construction environment should be undertaken.

3.5 Conclusions

The national reporting mechanisms which were reviewed in detail last year continue to use generally well defined processes for the collation and recording of safety data. These are largely unchanged and have matured, particularly the centralised SMIS facility in Milton Keynes. These processes, however, rely on accidents and other safety events being accurately recorded and reported into the systems. It is clear that there are some shortcomings evident in these arrangements.

The accuracy of FWIR and AFR data has been adversely affected by misinterpretation of the RIDDOR classification rules. This shortcoming was identified earlier in the year and revisions to the process have been made. Whilst these have strengthened the process, it has inevitably impacted on the Confidence Ratings for FWIR and AFR.

The recording of 'irregular working' events is reliant on the application of a great deal of judgement throughout the process from the initial identification through to classification across a very wide spectrum of events. The Confidence Rating reflects the difficulties this creates in recording all events correctly.

3.6 Assessment of Confidence Ratings

The ratings determined for the Safety Risk KPIs are set out below. They are explained and additionally summarised in Section 6, together with the ratings for the other KPIs covered in this report.

3.6.1 Fatalities and Weighted Injuries Rate

This was rated 'B2' at the previous audit. The issues highlighted in this review show that there have been problems in correctly reporting staff accidents. This has inevitably impacted on the rating for this measure although Network Rail has put in considerable effort to plug the shortcomings they themselves highlighted. Given these issues the appropriate rating is 'B3', the revised score reflects the greater focus this year on the local reporting arrangements. The highest Confidence Rating possible for this measure is considered to be 'A2'.

3.6.2 Accident Frequency Rate

This was rated 'B2' at the previous audit. The issues highlighted for FWIR apply equally to AFR. This has inevitably impacted on the rating for this measure although Network Rail has again put in considerable effort to plug the shortcomings they themselves highlighted. Given these issues the appropriate rating is 'B3'. The revised score reflects the greater focus this year on the local reporting arrangements. The highest Confidence Rating possible for this measure is considered to be 'A2'.

3.6.3 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 highest Confidence Rating possible for this measure is considered to be 'B2'.

3.6.4 Category 'A' SPADs 20+

The measure was rated 'A1' at the last review. This remains a highly documented and controlled process covering a relatively small data set with a series of inbuilt checks. The KPI remains at 'A1'.

3.6.5 Irregular Working

This measure was rated 'B3' at the last review. This report highlighted ongoing difficulties in the recording of all 'irregular working' events. This confirmed the findings from last year's higher level review and the rating remains the same at 'B3'. The highest Confidence Rating possible for this measure is considered to be 'A2'.

3.6.6 Infrastructure Wrong Side Failures

This measure was rated ‘A1’ at the last review. As it was not formally reviewed this time the rating remains unchanged.

3.6.7 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. Crime data will never capture every event given its nature and ‘B3’ remains the appropriate measure. The highest Confidence Rating possible for this measure is considered to be ‘B2’.

3.6.8 Level Crossing Misuse

This measure was rated ‘A3’ at the last review. The process for the overall KPI is well defined. The description anomalies highlighted do not impact on the Confidence Ratings. There remains the ongoing issue with near miss reporting which is never likely to improve much beyond its current levels. The measure remains at ‘A3’. The highest Confidence Rating possible for this measure is considered to be ‘A2’.

3.7 Recommendations

Table 3.1 contains a set of draft recommendations. The recommendations for these KPIs are combined, in Section 7, with those for the other KPIs under consideration in this report, in order to provide an overview of the recommendations made in the current Quarter.

It is recognised that Network Rail will review its response to these recommendations alongside those identified in the RSSB report to ensure it produces a coherent set of responses.

Number	Recommendations to Network Rail	Location in Text	Network Rail Data Champions	Due Date
2011SAF01	Implement a robust internal verification processes for accident reports to identify any shortcomings in reporting or classification.		Rod Reid	April 2011
2011SAF02	Standardise the requirements for near miss/close call reporting. Several different processes are being developed and these should be unified.		Rod Reid	April 2011
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	June 2011
2011SAF04	Carry out a review of local accident reporting procedures, most of which are un-documented, and document and adopt the good practices nationally. If appropriate include in line standards.		Rod Reid	June 2011
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	March2011
2011SAF06	Review the definitions and management of Irregular Working, in particular improving the classifications and initial reporting to improve real time management.		Rod Reid	June 2011

Table 3.4: Recommendations for KPI 1: Safety Risks

4 Infrastructure Condition Report and Network Condition Report

4.1 Definition and Description

The Infrastructure Condition Report (ICR) and Network Condition Report (NCR) are issued for each operating Period by Network Rail's Asset Reporting Team (ART), using inputs from a wide range of infrastructure-related data sources, and providing periodic 'snapshots' of the state of Network Rail's infrastructure.

The ICR is the larger of the two reports, is produced in spreadsheet and hard copy format, and is primarily for Network Rail's internal use, although it is also made available to ORR at their request. The NCR is a subset of the ICR, produced in spreadsheet format for ORR, and presents the periodic status of a subset of Regulatory Measures.

The ICR comprises seven main sections, which are summarised below, together with their contents:

- Foreword
    - Summary of the ICR contents and purpose, and contact details.
- KPI, or Asset Management, Summary
    - Summary of progress against targets/trends for the KPIs covered.
- Asset Stewardship Indicator
    - Numeric and graphical presentation of Asset Stewardship performance and trends, by Route and contributing indicator.
- Asset Condition / Faults - this marks the start of the main body of the ICR, and covers:
    - Track - Poor and Good Track Geometry, Track Geometry Faults, Super Red Eighths, Broken Rails, Isolated and Continuous Rail Defects, Track-Related Derailments, Track Buckles, and Points Failures.
    - Civil Engineering – Structures subject to additional inspections, Current Period additional inspections by type, and Number of Earthworks Failures.
    - Signal Engineering - Signalling Failures causing train delay (KPI NR s6.3), Signalling Failures causing more than 10 minutes train delay (KPI NR 6.3), Track Circuit Failures, Category B Signals Passed at Danger, Higher Risk Signalling Failures (KPI NR s1.3) - by Category, Higher Risk Signalling Failures (KPI NR s1.3) - by Location, and Highest Risk Signalling Failures (KPI NR 1.4).
    - Electrification and Plant - Signalling Power Supply Failures causing more than 10 minutes train delay, Signalling Power Supply Incidents causing significant Train Delay (KPI NR 6.13), Traction Power Supply Incidents causing significant Train Delay (KPI NR 6.7/8), Traction Power Supply Incidents causing substantial Train

Delay, and Electrification failures causing more than 10 minutes train delay.

  - Telecoms Engineering - Higher Risk Telecoms Failures, and Telecom Failures causing more than 10 minutes train delay (KPI NR 6.12).

- Train Performance
  - Infrastructure train delays and Number of Infrastructure incidents (formerly KPI NR 6.11).
- Targets
  - Internal Network Rail year-end Targets for 2010/11.
- Summary ORR Measures
  - Summary of ORR Asset Measures.

The NCR includes the following data:

- Track Geometry
  - Rail top and track alignment profiles (Regulatory Measure M3)
  - 'Super Reds' (percentage of eighths miles containing Super Red track geometry)
  - Percentage of Super Reds by Country (i.e. England & Wales, Scotland, and Network-wide)
  - Number of L2 Exceedences (Top, Line, 3 metre Twist and Gauge) per Track Mile (Regulatory Measure M5) by Route.
  - Number of L2 Exceedences per Track Mile by Country
- Isolated Defective Rails by Route and Country (Regulatory Measure M2)
- Continuous Defective Rails (Discovered, Ground or Removed, and remaining), measured in yards, by Route and Country (Regulatory Measure M2)
- Numbers of Broken Rails by Route and Country (Regulatory Measure M1)
- Number of train derailments on Network Rail-controlled infrastructure caused wholly or partly by track fault by Route, Country and Line category
- Number of signalling failures causing train delays by Route and Country
- Number of signalling failures causing train delays over 10 minutes (Regulatory Measure M9) by Route and Country
- Signalling High Risk Failures (with Hazard Rating of 20 or more), split by Obscured Signals, Leaf Fall, and Other causes
- Traction Power Supply Incidents Causing Train Delays in excess of 500 minutes. (Regulatory Measures M11 & M12), split by AC and DC power

- Number of Infrastructure Incidents that Cause Delay, by Incident Category

The Network Asset Stewardship Incentive Index (ASII) and Route Asset Stewardship Indices (ASIs) are no longer included in the NCR (both were CP3 Regulatory Measures).

The two spreadsheets also contain some hidden worksheets, containing data used to generate some of the outputs listed above.

As reported in 2009/10, the data used to produce the ICR and NCR are imported from various sources into a single Access database ('ICRetcDATASTORE.mdb'), which is then used to filter and aggregate the data to produce the contents of the ICR and NCR.

4.2 Audit Methodology

4.2.1 General

The 2009/10 review of the ICR and NCR focussed on the master database and spreadsheets used to populate and present the two reports, checking the computational accuracy of the contents of the ICR and NCR, and their consistency with internal Network Rail specifications and work instructions.

The 2009/10 review also included some checks of the contents of the master database against a sample of the multiple external data sources used to populate it. The variety and extent of the source data precluded the conduct of exhaustive checks within the time and budget available for the review, but it was agreed that additional 'upstream' data checks should be conducted over the course of the current Control Period, to check whether the high standards of accuracy and consistency found within the ICR and NCR are also maintained within the source data and processes. It was therefore agreed to include three of these upstream checks in the 2010/11 review, and that the individual measures for review should be agreed with ORR at the outset of the review.

For the purposes of the review and checking process, it was agreed that a review would be undertaken of any changes to the documentation and processes used to produce the ICR and NCR from the master database, and that some checks would be conducted of the data and processes used, in order to verify that the high standards observed in 2009/10 remain in force.

For the upstream data checks, it was agreed that we would conduct meetings with the staff responsible for the collection and provision of the data, and obtain copies of available documentation and samples of data and any spreadsheets and databases used for intermediate processing between collection and input to the master database. It was agreed that we would review the adequacy of the documentation, and check the data and processes for accuracy and for consistency with the documentation and with the contents of the master database, and that we would report our findings and make any necessary recommendations for improvement.

An initial meeting was held with ORR on 10th November 2010, to discuss and agree the detailed scope and focus of the ICR and NCR review. At this meeting, it was agreed that the upstream data checks should focus on the following three measures:

- Points Failures;
- Good Track Geometry; and
- Structures Subject to Additional Inspections.

Subsequent discussions with Network Rail revealed that the first of these measures was in the 'Under Development' category, and was the subject of considerable debate within Network Rail, and thus subject to change. It was therefore agreed with ORR that the 'Isolated Rail Defects' measure should be reviewed instead. The agreed three measures were therefore:

- Good Track Geometry;
- Isolated Rail Defects; and
- Structures Subject to Additional Inspections.

A formal initial meeting was held on 22nd November 2010 with Network Rail's Data Champion for the Reports and with the Asset Reporting Specialist responsible for the collation of the Reports, to identify any changes that had taken place over the previous year, and to review and confirm progress with the recommendations made in the 2009/10 reporting sequence. Arrangements were also made at this meeting for subsequent visits and data collection/transfer for review purposes, and for the identification of the upstream data sources to which the checking process was to be extended; the required contact details were also obtained to arrange the necessary meetings and visits.

Based on the knowledge and experience gained in the course of the 2009/10 review, the 2010/11 checks on the ICR, NCR and master database focussed on those parts of the processes requiring manual intervention, and on the recommendations made in the 2009/10 report. It is understood that the structures of the master database and ICR and NCR spreadsheets have not changed materially since the 2009/10 review.

4.2.2 Import of Source Data

In the 2009/10 review, a sample of source data was compared with the database contents to verify that the data were being imported consistently and correctly. For the 2010/11, review, the focus was upon the three specific measures listed above, i.e. Good Track Geometry, Isolated Rail Defects, and Structures Subject to Additional Inspections.

4.2.3 Database

The master database was subject to detailed checks during the 2009/10 review process, and we understand that no significant changes have been made to it since then. The database has therefore not been subject to further detailed review for the purposes of the 2010/11 audit process, but some checks were performed on its outputs, checking them for consistency with the 2009/10 equivalents and with the contents of the 2010/11 Period 07 ICR and NCR.

4.2.4 ICR

As noted in 2009/10, the ICR comprises two separate spreadsheets, each of which uses data contained in a single worksheet named 'CALC', and obtained from the database referred to above, to produce the tables and charts presented in the ICR. A series of lookups and other formulae are used to extract the data required for the various measures.

As noted above, checks were undertaken to verify consistency of data between the contents of the master database and the two spreadsheets comprising the ICR. Checks were also conducted as to whether the ICR-specific recommendations made in the course of the 2009/10 reporting process had been implemented, and the related documentation updated as necessary. Some spot checks were also conducted on some of the worksheets comprising the two ICR spreadsheets, to check for the presence of any errors.

4.2.5 NCR

Similarly to the ICR, the NCR includes a worksheet named 'Data', containing the data used to generate the requisite tables and charts (these data are a subset of those held in the equivalent ICR worksheets).

Again, as noted above, checks were undertaken to verify consistency of data between the contents of the master database and the NCR. Some spot checks on the internal data consistency of the NCR were also conducted.

4.2.6 Specific Measures within the ICR and NCR

As noted above, it was agreed that the data and processes employed in the reporting of three specific measures should be reviewed: Good Track Geometry, Structures Subject to Additional Inspections, and Isolated Rail Defects.

4.2.6.1 Good Track Geometry (GTG)

A meeting was held on 29th November 2010 with the Asset Reporting Specialist responsible for processing and collating the Good Track Geometry data, and passing them to the members of the Asset Reporting Team responsible for collating the ICR and NCR. The processes used were explained, and additional documentation and sample data for 2010/11 Period 07 were subsequently provided.

It was explained that track geometry data are obtained from Track Recording Vehicles, such as the New Measurement Train, and then returned electronically to Derby, where they are processed and filtered of outlying records, prior to being uploaded to the Track Geometry Reports (TGR) database for subsequent processing and use, including the production of the GTG inputs to the ICR.

The target maximum recording interval for track across the national network is one year; busier routes tend to be measured more frequently, while less heavily-used routes may miss the target for a variety of reasons, including the prioritisation of busier routes. Data which are more than 450 days old are excluded from the process and the resulting measures.

Using the datasets and documentation provided, some checks were undertaken to replicate the steps taken between the receipt of the processed Measurement Train data and the production of the final GTG results for inclusion in the ICR, and thus to verify the process and documentation.

4.2.6.2 Structures Subject to Additional Inspections

A meeting was held on 3rd December 2010 with the Senior Asset Performance Specialist (Buildings and Civils) responsible for processing and collating the data relating to Structures Subject to Additional Inspections, and passing them to the members of the Asset Reporting Team responsible for collating the ICR and NCR. The processes used were explained, and additional documentation and sample data for 2010/11 Period 07 were subsequently provided. A subsequent meeting was held with a Route Structures Engineer and Structures Management Engineer at Waterloo on 15th December 2010, during which the data entry principles and processes were explained and demonstrated, and some process documentation was provided. The provided documentation covers the overall CARRS (Civil Assets Register and electronic Reporting System) Additional Inspections Process; the detailed process documentation, covering the manipulation of data, was unavailable in hard copy because of an ongoing office move, and was also unavailable in electronic form.

This measure records the number of structures subject to additional inspections (not the actual number of additional inspections, since some structures, e.g. viaducts, may require more than one). A Periodic 'snapshot' of the situation is generated from data held in the CARRS database. The measure includes inspections that are in progress, planned, scheduled or have been requested. Requests are typically generated by Amey or as a result of a review of a previous examination report, and may be triggered as a direct result of a previous report, as a result of an incident reported at a structure, or because of a common issue with a single structure type of a particular design. Requests are handled and input to CARRS by the Route Structures Engineers' teams.

4.2.6.3 Isolated Rail Defects

A meeting was held on 6th December 2010 with the Head of Asset Management (Track) and the Principal Engineer (Track), with overall responsibility for the management and reporting of Isolated Rail Defects.

A subsequent meeting was held on 20th December 2010 at Ashford MDU with the Senior Maintenance Support Engineer (Rail Management) and the Section Manager (Rail Testing), to review the RDMS (Rail Defect Management System) data entry process and documentation.

4.3 Audit Findings

4.3.1 Import of Source Data

The source data import checks were focussed on the three specific measures listed above, i.e. good Track Geometry, Structures Subject to Additional Inspections, and Isolated Rail Defects. The findings for each are described in detail in the following sub-sections.

4.3.1.1 Good Track Geometry:

The files provided by Network Rail for checking purposes are listed below:

1. 'Perend2010.doc' – Contains instructions for carrying out the reporting procedures;
2. 'TGsourcep07&06_ref.mdb' – Contains source data for Period 06 and 07, plus two additional tables required for the linking of the databases;
3. 'TGcalc.xls' – Part of the suite of report calculation;
4. 'TGcalc.mdb' – Part of the suite of report calculation;
5. 'TGRmacros.xls' – Part of the suite of report calculation;
6. 'TGR06y17.xls' – Contains period 06 report produced by NR; and
7. 'TGR07y17.xls' – Contains period 07 report produced by NR.

Of these files, the first contains the data processing instructions, the second contains the source geometry data, the third, fourth and fifth contain procedures and macros used in the calculation process, and the last two contain the outputs for 2010/11 Periods 06 and 07, respectively.

The data-processing instructions followed to replicate the Period 07 report are contained in section 'Stage 2A' onwards of the internal Network Rail document 'Perend2010.doc'. The contents of this document are sufficiently detailed to enable the checking process to be completed successfully; however, the document is quite densely laid out, and its readability could usefully be improved by revising its formatting and layout.

It was found that, using the data and instructions supplied, the Period 7 report was replicated with very small marginal differences (all well within +/- 0.1%, and usually within +/- 0.04%). We understand that one of the source datasets, the table 'All Track', is 'live', and thus subject to continuous updating, and that this is likely to account for the small discrepancies observed.

On the basis of our findings, the Confidence[Rating for Good Track Geometry is B2, based on the fact that documentation is available, but the process is currently heavily dependent upon one individual (it could otherwise be A2), and on the need for manual intervention, despite the observed accuracy. In its current state, A2 is the highest rating this measure could realistically achieve; however, we understand that Network Rail have plans for process automation and improvement, in which case a rating of A1 would be a realistic aspiration.

4.3.1.2 Structures Subject to Additional Inspections

The input of data to CARRS is very much 'system-driven', with little manual intervention, although the system is somewhat 'clunky', and some copying and pasting of records is required. Comprehensive documentation of the overall process is in place, although this is undated and unsigned. We understand that detailed documentation of the day-to-day use of CARRS is also in place, although this was not available to see on the day of the Waterloo office visit. Requests for

additional inspections are triggered by incoming inspection reports, uploaded by Amey, and typically followed up by a phone call, if the request is urgent.

CARRS is Territory-, rather than Route-based, reflecting the situation at the time of its implementation, and it is therefore necessary to disaggregate and / or re-assign the reported data have to Route level. Some records (e.g. scheduled repeat inspections of bridges with cast iron elements, and some Additional Assessment records, depending on the coding adopted by the Route in question) need to be deleted from the data prior to reporting, and there is also an issue in respect of the assessment categories used in Scotland – rationalisation of the process used has been proposed, but has not yet been implemented.

The extraction of data from CARRS, and their manipulation prior to their delivery to the Asset Reporting Team, requires a degree of spreadsheet-based manipulation, although the required processes are internally documented. A simple checking procedure is in place to identify and remove multiple records of a single structure. This need for manual intervention confirms the 'clunkiness' of the system, referred to above; internal documentation is in place, however, setting out in detail the steps to be taken to produce the required outputs. The process appears to be reasonably straightforward and well-understood, and its application is evidenced by the data transformations seen in the relevant spreadsheets.

Network Rail wishes to move towards a streamlined and automated 'button-pushing' process, and it is understood that planning is underway to replace CARRS with a more suitable, automated, off-the-shelf system (augmented as required, to meet Network Rail's specific requirements) within the next 18 months, so there is probably little point in trying to improve existing processes and documentation, which appear to be working well in any case, within the intervening period.

Using the datasets and documentation provided, the 2010/11 Period 07 outputs were compared with the contents of the Period 07 ICR, and found to be identical. No errors were found in the calculation process. The Confidence Rating for this measure is A2, based on the fact that it is documented, but also that manual intervention is required, notwithstanding the observed accuracy of the results. As things stand, A2 is the maximum feasible rating; if the replacement of CARRS enables further automation of the process, as planned, an A1 rating should be attainable.

4.3.1.3 Isolated Rail Defects

The primary purpose of RDMS is the management of rail defects, i.e. their rectification and removal, and the reporting functionality that it provides is essentially a by-product of the defect management system.

Rail defect data are obtained both automatically, from the Ultrasonic Testing Unit [i.e. train] (UTU), and manually, by means of walks along the line using portable ultrasonic testing equipment. The latter approach is used for junctions, S&C, and lower-category lines, with use of the UTU being restricted to higher category (1-3) plain line sections.

Data from the UTU are processed in Derby and uploaded automatically to RDMS, while data collected manually are entered in paper forms, which are then copied manually into RDMS. The accuracy and reliability of the manual data entry

process are enhanced by the facts that the paper forms mirror the screen-based RDMS data input forms, most of the entries in RDMS are selected from drop-down lists, and those entries that require 'free text' input, specifying track mileages and chainages, are easily checked and verified in the course of the resulting site visits to carry out remedial works. The processes used are documented within the RDMS system (i.e. the documentation is available on the screen, in straightforward, intuitive form), and the documentation is backed up by hand-held flipcharts/prompt cards, and training programmes are in place, although much training is done 'on the job'.

The Isolated Rail Defects data are extracted from RDMS by the Asset Reporting Team, and the data are pasted into an intermediate spreadsheet ('Rail defects Calc PXX.xls', where XX is the appropriate Period number). The data from individual MDUs are automatically amalgamated into the appropriate Routes in this spreadsheet, prior to their inclusion in the master database and thus the ICR and NCR, as described in internal Work Instruction AR-WI-008. As noted above, the reporting facility is a by-product of RDMS's main functionality, and this intermediate processing requirement, while not ideal, and representing something of a 'weak link' in the overall process, is probably unavoidable without an update of RDMS, and is well-documented and reasonably straightforward in its application, and therefore presents only a small risk to data integrity.

The data extracted from RDMS for 2010/11 Period 07 for inclusion in the ICR and NCR were obtained from Network Rail and checked against those presented in the ICR and NCR, following the procedure set out in Work Instruction AR-WI-008. The contents of the spreadsheet 'Rail defects Calc P07.xls', containing the RDMS outputs were checked against the corresponding values in the master database 'ICRetcDATASTORE.mdb', and against the values contained in the ICR and NCR for Detected and Remaining Isolated Rail Defects; some spot checks were also conducted against the Repaired or removed Isolated Rail Defects category in the NCR. All values were found to be consistent, and no errors were found. The Confidence Rating for this measure is also A2, again based on the fact that it is documented, but also that manual intervention is required, again despite the observed accuracy of the results. As things stand, A2 is the maximum feasible rating; it seems unlikely that this will change in the near future.

4.3.2 Database

The master database 'ICRetcDATASTORE.mdb' was subject to detailed checks during the 2009/10 audit process, and we understand that no significant changes have been made to it since then; the database has therefore not been subject to detailed review for the purposes of the 2010/11 audit process.

The outputs from the 2010/11 Period 07 database were checked against those from the previously-checked version, and found to be consistent in nature for the various metrics reported.

4.3.3 ICR

The checks conducted on the two spreadsheets used to produce the ICR are described in the following two sub-sections, together with our findings.

4.3.3.1 ICR – Part 1 Spreadsheet

The output from the master database was compared with the data contained in worksheet 'CALC' of the spreadsheet 'DRAFTPart1ICR Pd07_2010_11.xls'. It was found that the data had been transferred accurately and completely from the database to the spreadsheet.

The ICR-related recommendations made in the 2009/10 Q3 report were reviewed and were both found to have been incorporated. It was also noted that the internal Network Rail Work Instructions for the ICR have been updated to describe any inconsistencies and other details within the spreadsheets that users need to be made aware of.

Most of the worksheets in the spreadsheet are fully automatic, and, where 'hard-coded' values are used, they are well-documented in the associated Work Instructions. An additional step has been added to the production of the 'Track 10' and 'Track 11' worksheets. Tables for these, track related derailments and 'Buckles', respectively, are created on a separate worksheet, which is normally hidden, and pasted in as a pictures. This additional step is reflected within the updated ICR Work Instructions.

Some spot checks were carried out to identify possible accidental errors. For the worksheets 'ASI values', 'Track 1an', and 'Track 9a', it was checked whether current Period values had referenced the correct worksheet cells. No errors were found.

No checks were conducted on worksheet 'ASI route' as we understand that this was under development at the time of the review, as stated in the accompanying Work Instruction. We will review this in more detail during next year's audit.

4.3.3.2 ICR – Part 2 Spreadsheet

The output from the master database was again compared with the data contained in worksheet 'CALC', this time of the spreadsheet 'DRAFTPart2ICR Pd07_2010_11.xls'. It was again found that the data had been transferred accurately and completely from the database to the spreadsheet.

Spot checks for accuracy were carried out on several worksheets, as follows:

- Worksheet 'Civils 2c'- additional charts have been included since the 2009/10 review. Hard coded ASI targets are applied on row 23, and weightings on row 26. These values have been provided with notes to the worksheet itself and to the ICR Work Instructions to inform users that this is the case.
- Worksheet 'Civils 4' - the structure of this worksheet is unchanged from the previous version, apart from the tables containing 'details of failures', which have now been pasted in as a picture. This additional step has been documented.
- Worksheet 'Signal 2a' - it appears that, in general, the 'traffic light' comparator for the Period/YTD actual values is based on a comparison with the Period/YTD target values; however, where target values are not available, they are compared instead with the previous year's values. Although target values are not available on this worksheet, the 'traffic

lights' have been set up for comparison with the target values, rather than the previous year's values, and hence no traffic lights have been triggered.

- Worksheet 'E&P 5' - the issue identified in worksheet 'Signal 2a' above again applies (i.e. 'traffic light' issue).
- Worksheet 'E&P 4' - the issue identified in worksheet 'Signal 2a' above again applies (i.e. 'traffic light' issue).

4.3.4 NCR

The output from the database 'ICRetcDATASTORE.mdb' was compared with the data held in the worksheet 'data' of the spreadsheet 'Network Condition Report - 2010-11 Period 07.xls'. It was found that the data had been transferred correctly from the database to the spreadsheets.

Some spot checks were conducted on the internal consistency of the NCR spreadsheet, and no errors or inconsistencies were found.

4.4 General Observations

As noted in 2009/10, although the processes employed to produce the ICR and NCR are described in considerable detail by Network Rail's internal documentation, 'official' specifications of the Reports, and descriptions of their nature, purpose, and their intended audiences, do not appear to be available. We understand that this issue is the subject of ongoing discussions between Network Rail and ORR.

As also noted in 2009/10, some of the upstream data sources, such as PSS, are highly automated and specified, and not dependent on individual expertise; others, however, are less well-documented and less widely understood, and their accuracy and consistency are much more dependent upon the specialist knowledge of various members of Network Rail staff, and thus present a degree of risk to business continuity.

4.5 Conclusions

The production of the ICR and NCR from the central ICR database is highly automated and well documented, and is robust and accurate. As noted in the 2009/10 review, however, some of the 'upstream' data sources and collection and refreshment processes are comparatively manual in nature, and are less well-documented and widely understood.

It would again be useful to have a single, controlled specification document available within Network Rail and ORR, setting out the purposes, requirements and methods of preparation of the ICR and NCR, although, as noted above, this depends upon the outcome of ongoing discussions between Network Rail and ORR.

4.6 Assessment of Confidence Ratings

The rating determined for the ICR and NCR is set out below. It is also summarised in Section 6, together with the ratings for the other measures covered in this report.

As noted in the course of the 2009/10 review, a robust system is in place for producing the periodic ICR and NCR, and the procedures used are automated where possible (although a significant amount of data are copied and pasted in the process), and thoroughly documented, with the documentation being updated as necessary to reflect changes that are introduced, as witnessed by this year's review and findings.

However, as also noted in 2009/10, the population and refreshment of the database used to generate the two Reports relies upon a wide range of disparate upstream data sources and processes, some of which (e.g. performance-related data) are highly automated and well-documented and understood, whereas others (e.g. broken rails) are based on comparatively manual and subjective means of recording and interpretation. Based on the data received and reviewed by the Reporter, and notwithstanding the findings for the three individual measures reviewed for this report, the audited Reports have a Confidence Rating of 'B2', unchanged from 2009/10. The highest Confidence Rating possible for this measure is 'A2'.

Considering the three individual elements of the ICR and NCR, these were also reviewed, and received individual Confidence Ratings as follows:

- Good Track Geometry (GTG): 'B2'
- Isolated Rail Defects: 'A2'
- Structures Subject to Additional Inspections: 'A2'

(Note: the use of a single rating for the two Reports reflects the fact that the NCR is a subset of the ICR, and also that not all the upstream data sources and refreshment processes were individually reviewed.)

4.7 Recommendations

Table 4.1 contains our draft recommendations. The recommendations are numbered 2011.NCR.1 and 2011.NCR.2, to reflect the current year and the Regulatory data to which they apply. These recommendations are combined, in Section 7, with those for the other KPIs under consideration in this report, in order to provide an overview of the recommendations made in the current Quarter.

Number	Recommendations to Network Rail	Location in Text	Network Rail Data Champions	Due Date
2011NCR01	Complete discussions with ORR to resolve asset reporting requirements.	Section 2	Mary Jordan	March 2011
2011NCR02	Correct minor discrepancies in 'traffic light' functionality in Part 2 ICR spreadsheet.	Section 5.3.3.2	Mary Jordan	March 2011

Table 4.1: ICR / NCR Recommendations

5 KPI 6(c): Asset Management (Station Stewardship Measure and Light Maintenance Depot Condition)

5.1 Introduction

Subsequent to the submission of the 2009/10 report covering Asset Management KPI 6c a number of discussions between the ORR, Network Rail and Arup took place. As a consequence of these discussions, the survey audit process used in Q3 2010/11 differs from the first round in that the Reporter team were no longer concerned with checking the quantum of materials that make up the station or depot (which had formed a significant part of the last audit) but were principally focused on reviewing the Asset Remaining Life (ARL) of these individual elements leading to the re-evaluation of measures M17 - Station Stewardship Measure (SSM) and M19 - Light Maintenance Depot Condition (LMDC).

5.2 Methodology

5.2.1 Station Stewardship Measure (SSM)

5.2.1.1 Introduction

The objective of the audit is to determine whether or not the SSM score is being reported correctly by auditing a sample of stations and independently comparing an observed score with that reported in the Annual Return. In order to achieve a fair representation of the accuracy of the scores, the locations for audit surveys were selected to achieve a broad distribution over the Routes and across the six categories of station. The majority of stations are in categories 'E' and 'F' and as such the sample set has been appropriately weighted to take this into account. Fifty stations were selected for audit as listed in Table 5.1. This represents a sample size of 2.2%, which is believed to be realistic for a Reporter audit given the broad distribution covered. In the event, a small number of variations were made to the originally proposed list of stations the details of which are described in Table 5.2.

		Station Category						
		A	B	C	D	E	F	Total
Network Rail Routes	Scotland		Inverness		Milngavie Shettleston	Bearsden Larbert Cumbernauld Croy	Hillfoot Carntyne Bellgrove Camelon	11
	London North East			Barnsley	Hartlepool Meadowhall	Skegness Boston	Seaton Carew Billingham Heckington Havenhouse East Garforth	10
	London North West	Stockport	Birmingham Moor Street	Salford Crescent Bolton	Bangor	Workington Whitehaven Windermere	Conwy Goostrey	10
	Southern & East Anglia	Fenchurch St	East Croydon	Weymouth		Littlehaven Chipstead	Faygate Warnham Wymondham Attleborough	9
	Western			Paignton	Port Talbot Parkway Totnes	Pangbourne Goring & Streatley	Briton Perry Baglan Torre Cholsey Reading West	10
	Total	2	3	5	7	13	20	50

Table 5.1: Site Inspection Locations

Originally Proposed Station	Reason for Change	Replacement Station
Dodworth (Cat 'F', LNE)	No survey report available in OPAS	East Garforth (Cat 'F', LNE)
Spooner Row (Cat 'F', SE&A)	Adverse weather conditions	Camelon (Cat 'F', SCOT)
Culham (Cat 'F', WEST)	Short winter daylight hours	Cholsey (Cat 'E', WEST)
Bordesley (Cat 'F', LNW)	Station closed during the week	Goostrey (Cat 'F', LNW)

Table 5.2: Variations to the Agreed Station Inspections

For each location, it was agreed with the ORR and Network Rail that a minimum of 25% of the individual asset measures in the Network Rail survey would be audited. This level was set to provide an adequate representation of the overall quality of the survey at the location. In the event, an average sample size of 66% was achieved. The ability of the team to audit individual measures was based on the level of detail in the Network Rail survey, the accessibility of the element and the available time. No attempt was made to selectively favour particular classes of asset but merely to undertake as complete an audit as practical.

5.2.1.2 Joint Survey

Prior to carrying out the audit surveys, the Reporter team met with an Amey surveyor during their review of asset condition at Thirsk station. The purpose of this was to verify the survey process and raise any points for clarification.

The full record of the meeting is included in Appendix A; however key points are discussed in Section 5.4.

5.2.1.3 Discussion with Network Rail Route Building Engineer

As part of the review, and as a repeat of the practice undertaken during the 2009/2010 audit (with the Route Building Engineers from Scotland and the South East), a discussion was held with one of the Network Rail Route Building Engineers for LNW. The purpose of this was to understand, from the Network Rail side, the processes involved with the planning and review of survey data.

A record of the telephone discussion is included in Appendix E.

5.2.1.4 SSM Calculation

Subsequent to the submission of the Q4 2009/10 report, there were a number of discussions between the ORR, Network Rail, and the Reporter team relating to the conclusions and recommendations in that report. The previous round of surveys checked the quantum and remaining life for each element. However, as part of the said discussions it became apparent that the algorithm used to calculate the SSM score relied exclusively on the Asset Remaining Life (ARL) i.e. measures 'F1' and 'F2' in the survey reports, and that the quantum of the elements had no bearing on the SSM. It was therefore agreed that for this round of survey audits the Reporter team would principally focus on the ARL. Due to the resulting reduction in work at each station, it became possible to survey more stations in the available timescale. This was seen as important since the previous survey had been criticised because of its limited scale.

As part of the SSM algorithm discussions, Network Rail made available to the Reporter team document NR/ARM/M17PR "Network Rail Asset Reporting Manual – Procedures for the Reporting of Station Stewardship Measure". This has been revised significantly since the 2009/10 audit and now details the SSM calculation and provides details of the basis for scoring each individual element by use of Asset Weighting Factors (AWF) and Asset Condition Ratings (ACR). Significantly, also included in this document is a statement on the Asset Life Expectancies (ALE) which should be adopted for each asset type.

The AWF and ACR factors are used to assign a rating to each asset depending on its operational significance and its surveyed condition relative to its ALE. The individual asset ratings are then combined in the algorithm to generate the SSM. This calculation is detailed further in Appendix B.

Whilst the AWF is a given for any asset, the assessment of the ACR is a function of the work undertaken by the surveyors on site. As such it relies on their assessment of asset condition compared to the life expectancy to achieve an accurate input to the algorithm.

5.2.2 Light Maintenance Depot Condition (LMDC)

5.2.2.1 Introduction

The process for auditing the depot surveys is broadly the same as that for the stations.

It was agreed that three depots (only one had been reviewed during 2009/10) would be audited. The randomly selected sites were:

- Swansea Landore;
- Leeds Neville Hill – RNE; and
- London Camden Primrose Hill.

However, when the reports and drawings were downloaded from OPAS, Swansea was the only site with a complete survey. The survey report for Leeds was a 'Recon'[1] survey only and as such did not contain any meaningful level of detail. The survey report for London Camden contained thirteen measures for the entire depot and as such was not deemed to be of use to the audit other than indicating a potential lack of detailed information in OPAS.

As part of the review we sought to understand the basis for the scoring of these locations in the Annual Returns given the lack of detailed asset knowledge. The source of the current LMDC for these locations is understood to be based on the previous methodology and as such represents only a high level view of the depot's condition. It is believed that Network Rail is seeking to remedy this lack of detail in the course of the current programme of surveys delivered by their contractor and this was borne out in discussion with the Route Building Engineer who stated that, in LNW at least, a high proportion of the depots already had detailed surveys.

[1] A Recon survey is carried out in advance of the main fabric survey to identify, or verify, the individual blocks that make up a station location. No measurement of assets is carried out at the Recon stage.

As a result a high level review of all depot data was undertaken to determine the overall level of detail.

As a replacement for Neville Hill and Camden records were downloaded for London Hornsey and Edinburgh Craigentinny. The report for Craigentinny was also only a 'Recon' survey; however a more complete survey was available for Hornsey.

As a result of these discrepancies, only two depots were given site inspections by the Reporter team, these being Swansea Landore and London Hornsey.

In order to achieve a consistent approach, the depots were surveyed by the same Reporter survey team as the stations.

5.2.2.2 LMDC calculation

The process for reporting the LMDC is set out in the following Network Rail documents;

- NR/ARM/M19PR: 'Network Rail Asset Reporting Manual – Procedures for the reporting of Light Maintenance Depot Condition' Issue 5, 11 February 2009.
- NR/ARM/M19MN: 'Network Rail Asset Reporting Manual – Supplementary manual for the reporting of Light Maintenance Depot Condition' Issue 2, 22 March 2004
- NR/ARM/M19DF: 'Network Rail Asset Reporting Manual – Definitions for the reporting of Light Maintenance Depot Condition' Issue 3, 17 February 2004.

The calculation of the LMDC is detailed in Appendix B. It should be noted that whilst the station scores include all assets and apply an Asset Weighting Factor depending on their individual significance in relation to the operational use of the station, the depot score is built up from the condition of eleven specific elements. The calculation then takes an average score across these elements. This average score is based on equal weighting for all elements (unlike the case for the Station Stewardship Measure), that is, the Asset Weighting Factor is a constant for all measures in the calculation.

5.2.3 Audit Methodology

For each station or depot, the latest available version of the survey report and drawings were downloaded from OPAS. The audit at each site consisted of checking the ARL of each accessible asset measure, and comparing it to the ARL recorded in the Network Rail survey report. There were some elements which could not be surveyed by virtue of their location.

As discussed earlier, the documents detailing the SSM procedure and the listings of Asset Life Expectancy (ALE) for each asset were not available for the previous audit and so the methodology employed was changed from the earlier round. Previously, if it was felt that the measured ARL was appropriate or was underestimated it was accepted during the audit and was only marked as a failure if the Reporter team felt that it was significantly less. The publication and use of the ALE tables meant that the ARL audit was approached slightly differently.

The aim here was to try to be as pure to the published methodology as possible. A key factor in this was the use of tables of ALE and the category boundaries for each asset type.

There were five main checks carried out for each asset during a survey;

- Is the recorded ARL less than, or equal to the ALE listed?
- Is the recorded ARL better than surveyed, based on the ALE and observed condition ratings?
- Is the recorded ARL in the correct PARL banding or should it be changed?
- Is the recorded material type correct?
- Has the layout changed since the survey was carried out?

Network Rail provided the Reporter team with a list of layout changes to the proposed stations due to refurbishments and maintenance. However, layout changes to a number of stations were noted that were not captured in this list. Whilst these were usually minor in scale more significant changes were noted at:

- Hartlepool: where the car park layout had been modified and the ticket office building layout was not as shown on the drawings:
- Barnsley: where the adjacent access route had been significantly altered;
- Goring and Streatley: where the internal layout detail in two of the buildings appears to have been altered.

Upon completion of the audit survey, the number of audited measures were totalled and recorded along with any ARL, Material or Layout discrepancies.

An asset was only recorded as an ARL 'anomaly' if the reduction in ARL caused it to change from one Asset Condition Rating to another. This is the only circumstance which would have an impact on the overall station SSM; other variations having no affect whatsoever. If the ARL was not agreed with, but it remained in the same Condition Rating band, (i.e. it would have no impact on the overall SSM) it was accepted.

5.3 Findings Observed

The following graphs present the findings of the SSM audit.

5.3.1 SSM Results

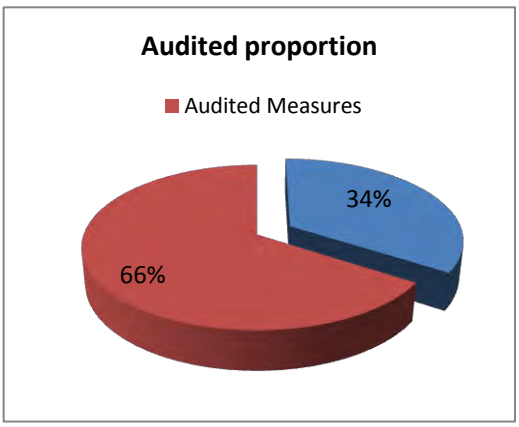


Figure 5.1: SSM Audit Level

As an average, 66% of the measures at the inspected stations were reviewed. The percentage of elements audited at the individual stations ranged between 35% and 99% (that is no station audit failed to make the 25% minimum). The actual number of measures audited depended on what was covered in the Network Rail survey and what was readily accessible.

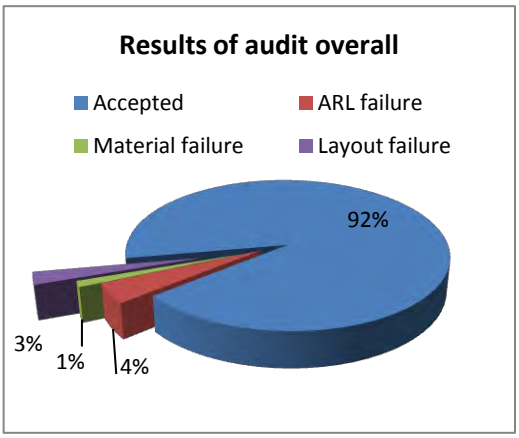


Figure 5.2: SSM Audit Results

Of the elements audited as part of this exercise 92% of the measures were deemed to be accepted. Of the remaining 8%, half were due to variations in the view of Asset Remaining Life and the remainder due to differences in the observed asset composition (Material), or there were changes to the arrangements on site (Layout)

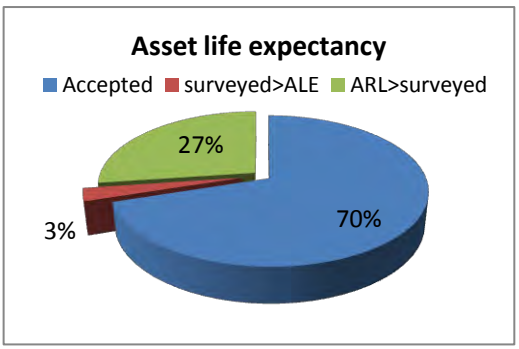


Figure 5.3: SSM Acceptable Results

Of the acceptable results (the 92% above) an average of 27% of the observed Asset Remaining Lives were considered to be better than that recorded in the Network Rail survey (individual sites ranged from 0% to 52%). In addition, 3% of acceptable measures were recorded by the Network Rail surveyor as being in excess of the defined ALE.

The results of the survey audits are included in Appendix C.

The greater level of understanding of the algorithm which generates the SSM has allowed the Reporter team to model the impact of these observations on the reported scores. Thus it has been possible to undertake the modelling for a sample of the stations in order to understand the impact the variations (both positive and negative) identified above have on the overall station stewardship measure. These stations were selected based on achieving a good sample level of representative stations showing improved RAL and failure levels. The results of this exercise are shown in Table 5.3 below:

Station	Station Category	NR Survey Date	Reported Score *	Modelled Score	Revised Score	Variation
Attleborough	F	31/07/07	3.44	3.44	2.68	21.9% better
Baglan	F	16/05/07	2.51	2.51	2.09	16.9% better
Bellgrove	F	28/11/08	2.45	2.44	2.39	2% better
Billingham	F	30/04/07	2.13	2.07	2.03	1.8% better
Birmingham Moor St	B	30/10/09	2.15	2.15	1.83	14.9% better
Briton Ferry	F	16/05/07	2.47	2.48	2.22	10.4% better
Carntyne	F	28/11/08	2.60	2.60	2.51	3.5% better
Chipstead	E	31/07/07	1.67	1.95	1.95	0.4% better
Conwy	F	30/04/07	3.00	3.00	2.24	25.2% better
Croy	E	15/07/07	2.26	2.26	2.10	6.8% better
Cumbernauld	E	24/08/07	2.57	2.58	2.54	1.6% better
East Croydon	B	13/10/07	1.84	1.84	1.87	1.4% worse
East Garforth	F	31/07/07	2.36	2.36	2.28	3.3% better
Faygate	F	31/07/07	2.11	2.11	2.23	5.8% worse
Fenchurch Street	A	13/10/07	2.84	2.84	2.67	6.1% better
Havenhouse	F	31/07/07	2.83	2.83	2.57	9.2% better
Heckington	F	14/11/07	1.83	1.83	1.94	6.3% worse
Inverness	B	21/10/07	2.04	2.08	2.00	4.1% better
Milngavie	D	09/01/09	2.50	2.52	2.43	3.4% better
Port Talbot Parkway	D	16/05/07	2.49	2.43	2.32	4.5% better
Salford Crescent	C	13/07/07	2.25	2.25	2.00	11.1% better
Seaton Carew	F	21/10/07	2.31	2.31	2.17	6.3% better
Warnham	F	31/07/07	2.02	2.02	2.05	1.4% worse
Windermere	E	22/02/08	2.39	2.40	2.37	1.4% better
Workington	E	24/08/07	2.98	2.98	2.97	0.3% better
Wymondham	F	28/09/07	3.36	3.06	2.50	18.3% better

*** From the Network Rail Annual Return 2010 Appendix 1**

Table 5.3: Impact on Individual Station SSM Scores

The above tabulation shows that the impact of the observed condition assessments has had an effect on the individual SSM scores. In the majority of cases this has shown an improvement in the overall score and this is particularly true, and not unexpected, where the ARL of elements have been shown to be improved. The above sample of twenty-six locations feature a range of station categories and geographic spread and represent a good mix however the spread of original survey results does favour more dated Network Rail surveys. However, the most recent survey is amongst the highest betterments.

The resulting impact shows variations in the region of -6.3% to +25.2% in the SSM score. The average is around 6% betterment.

5.3.2 LMDC Results

As discussed in Section 5.2.2, three depot locations had no, or very inadequate, surveys and, as a result, only two depots were subject to a site audit.

The following graphs present the results of the audit.

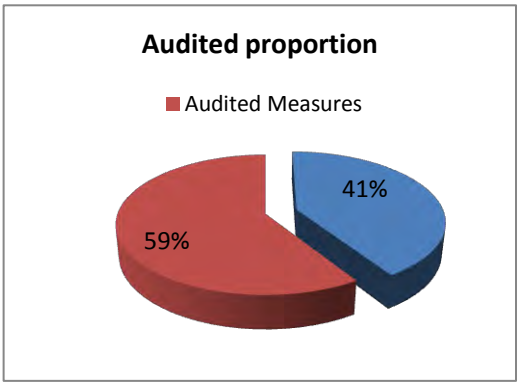


Figure 5.4: LMDC Audit Level

As an average, 59% of the measures at the inspected depots were reviewed.

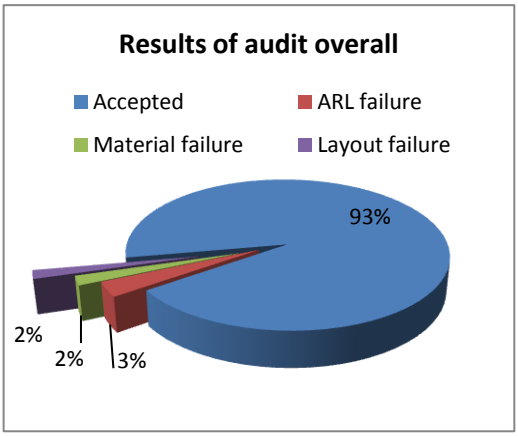


Figure 5.5: LMDC Audit Results

Of the elements reviewed 93% were agreed. Of the remaining 7%, 42% were not agreed due to perceived variations in the Asset Remaining Life and the remainder split between differences in the observed asset composition (Material) or changes to the arrangements on site (Layout).

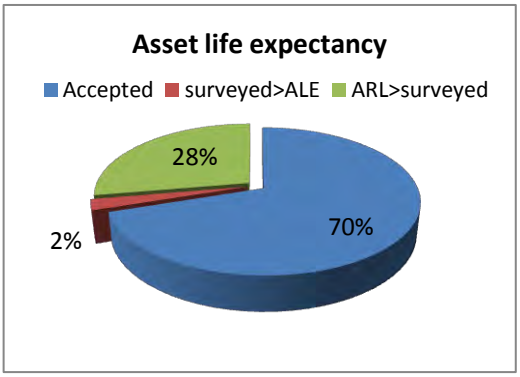


Figure 5.6: LMDC Acceptable Results

Of the accepted results, an average of 28% of the observed Asset Remaining Lives were considered to be better than that recorded in the Network Rail survey. In addition, 2% of acceptable measures were recorded as being in excess of the defined ALE.

The results of the survey audits are included in full in Appendix C.

When the results of the site observations were applied to the calculation of the LMDC it was noted that there was a small improvement in the score for Swansea by +1%. At Hornsey there was a larger variation of +12%. In both cases there are improvements in the ARL as well as degradation identified by the

observations on site. It is difficult to derive a firm view of the trends for the LMDC from these limited outcomes however, there would appear to be strong similarities with the findings from the station reviews.

The review of the LMDC is further complicated by the lack of measures to judge where the old methodology scores have been rolled forward pending full site surveys. As a result an assessment was made of the data currently contained in OPAS relating to the asset information held for depots, see Table 5.4.

Location	Depot	Survey Date	Survey Size (Measures)	Findings
Cambridge	Cavendish Road LMD	16/01/2009	19	Recon survey only - no detail
Clacton	LMD	11/12/2009	211	Fabric and M&E survey
Colchester	LMD	16/01/2009	16	Recon survey only - no detail
Chingford	London LMD		0	No reference to this site in the system
East Ham	London LMD	20/02/2009	37	Recon survey only - no detail
Ilford	London LMD	20/02/2009	58	Recon survey only - no detail
Crown Point	Norwich LMD	30/10/2007	329	Fabric and M&E survey
Shoeburyness			0	No reference to this site in the system
Southend	Victoria LMD	13/07/2007	18	Limited Fabric and M&E survey
Gillingham	LMD	27/06/2007	140	Fabric and M&E survey
Grove Park	London LMD		0	No reference to this site in the system
Orpington	Tcd LMD London	18/05/2007	13	Very limited Fabric and M&E survey
Slade Green	London LMD		0	No reference to this site in the system
St Leonards	LMD	22/12/2008	17	Recon survey only - no detail
Hull	LMD	27/02/2009	25	Recon survey only - no detail
Neville Hill	Leeds EMT LMD	25/09/2010	143	Very detailed Recon survey only
Neville Hill	Leeds NR LMD	ongoing	68	Very detailed Recon survey only
Letchworth		02/03/2007	17	Very limited Fabric survey
Bounds Green	London LMD	30/07/2010	693	Detailed fabric and M&E survey but recorded as being 'rejected'
Ferme Park	London LMD		0	No reference to this site in the system
Hornsey	London LMD	30/11/2007	428	Fabric and M&E survey but with more recent Recon
Heaton	Newcastle LMD	30/06/2010	597	Detailed fabric and M&E (30/09/10) survey
Sheffield		06/05/2010	99	Fabric and M&E survey
Skipton		03/12/2008	10	Recon survey only - no detail
Welwyn G C		02/03/2007	28	Very limited Fabric and M&E survey
Aylesbury		04/12/2009	65	Recon survey only - no detail
Barrow in Furness		20/04/2010	288	Fabric and M&E survey
Birkenhead North		20/11/2009	39	Recon survey only - no detail
Soho	Birmingham LMD	09/01/2009	29	Recon survey only - no detail
Tyseley	Birmingham LMD	09/01/2009	66	Recon survey only - no detail
Blackpool North		05/12/2008	20	Recon survey only - no detail
Bletchley		07/01/2011	137	Fabric and M&E survey from 27/07/07 but more recent Recon
Holyhead		09/01/2009	24	Recon survey only - no detail
Kirkdale	Liverpool LMD		0	No reference to this site in the system
Camden P'rose Hill	London LMD	18/05/2007	25	Very limited Fabric and M&E survey
Wembley Central	London LMD		0	No reference to this site in the system
Newton Heath	Manchester	27/09/2007	271	Fabric and M&E survey
Watford Junction		11/05/2007	7	Very limited Fabric and M&E survey
Oxley	Wolverhampton		0	No reference to this site in the system
Bedford	Midland	06/02/2009	18	Recon survey only - no detail
Etches Park	Derby	28/09/2007	272	Fabric and M&E survey with more recent recon (10/04/08)
Eastcroft	Nottingham	15/06/2010	75	Recon survey only - no detail
Clayhills	Aberdeen	31/03/2010	225	Detailed fabric and M&E survey
Townhead	Ayr	27/07/2007	26	Very limited Fabric and M&E survey
Craigentinny	Edinburgh	25/07/2010	185	Very detailed Recon survey only
Haymarket	Edinburgh	07/12/2007	319	Limited Fabric and M&E survey but very detailed Recon
Corkerhill	Glasgow	31/08/2007	126	Fabric and M&E survey
Shields	Glasgow	06/02/2009	26	Recon survey only - no detail
Yoker	Glasgow	05/12/2008	63	Recon survey only - no detail
Inverness		06/02/2009	40	Recon survey only - no detail
Perth		07/07/2007	103	Fabric and M&E survey
Victoria Grosvenor Rd	London LMD	14/03/2008	0	Recon survey only - no detail
Barton Mills		03/06/2010	241	Fabric and M&E survey
Bournemouth West LMD		19/03/2010	525	Fabric and M&E survey
Farnham		20/07/2007	230	Fabric survey with more recent recon (14/3/08) - fabric limited
Fratton		28/07/2007	121	Fabric and M&E survey
Clapham Junction	London LMD	27/07/2007	53	Limited Fabric survey, no M&E but full Recon
Stewarts Lane	London LMD		0	No reference to this site in the system
Strawberry Hill	London LMD	14/11/2007	45	Limited fabric and M&E survey
Wimbledon	London LMD		0	No reference to this site in the system
Ryde			0	No reference to this site in the system
Salisbury LMD		27/02/2009	0	Recon survey only - no detail
Bristol St Philips Marsh LMD		26/10/2007	282	Fabric and M&E survey
Cardiff Canton		27/02/2009	51	Recon survey only - no detail
Exeter St Davids			0	No reference to this site in the system
Kensal Green Washer	London LMD	02/03/2007	22	Very limited Fabric and M&E survey
Old Oak Common	London LMD	07/09/2007		Fabric and M&E survey
Machynlleth		20/07/2010	385	Fabric and M&E survey
Plymouth Laira LMD		31/01/2011	90	Recon survey only - no detail
Swansea Hig St LMD		03/06/2010	84	Fabric and M&E survey
Swansea Landore		02/08/2010	1115	Fabric and M&E survey
Worcester Shrub Hill				No reference to this site in the system

Table 5.4: Summary of OPAS Data for Reported Depots

The results show that there is far from complete data in OPAS for the depots with the following data split.

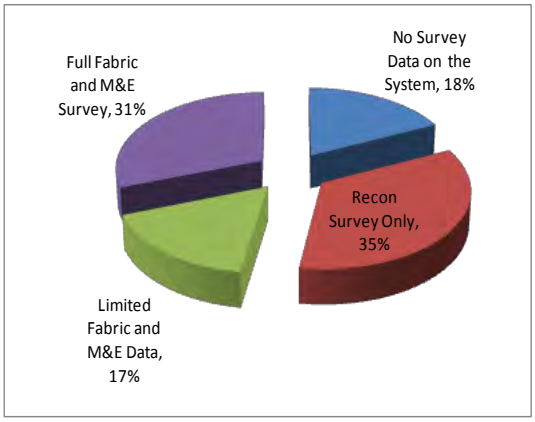


Figure 5.7: Breakdown of Depot Survey Data in OPAS

31% of the depot sites have recorded detailed surveys with a further 17% having limited information available. There is no data on which to make an assessment of LMDC through the prescribed process at 52% of the sites.

It is understood that the previous methodology is being used to record the asset condition where sites have not yet been surveyed in detail. The above review of the OPAS depot data would tend to indicate why there was some difficulty in the team selecting suitable sites at random to undertake reviews given that less than half have full surveys.

5.4 General Observations

5.4.1 SSM

The publication of document NR/ARM/M17PR which includes a detailed description of the process to calculate the SSM along with the tabulated ALE and condition bandings for each asset has had a significant effect on the audit results. When speaking to the Amey surveyor, he was not aware of the guidance note as it had only been published in October of 2010. However, he was familiar with the previous issue and it was clear that he understood the process if not the detail of the individual ALEs. What was observed throughout the audit process was that, particularly for long life items, there has been a significant degree of under-reporting of remaining life when compared with the condition bandings and the defined ALEs. It is the Reporter team's view that the use of the ALE table should provide consistency of scoring across the country as all surveyors will be working from the same starting point. This is not to say however, that without it, the data recorded will be incorrect but whilst surveyors may agree on the overall condition of an asset they may vary in their view of the Asset Life Expectancy. This was observed on sites where assets of similar condition were rated into different condition ratings as a result of variance in the assumed ALE. This is considered to be the principal cause of variation between the survey and audit results.

Whilst the documentation of the SSM process is welcomed, it is not clear whether the ALEs are overestimated or that surveyors are underestimating the assets. Examples of both were found on this round of audit surveys.

Examples of discrepancies in the ALE table include;

- Public Furniture, Cast Iron and Timber Seating: It is felt that the given ALE of 5 years for this asset is over conservative and that this should be higher, perhaps 15 years in line with the other seating assets
- Structures (Horiz), Beams, Girders, Joists & Purlins, Steel: There are two instances of this asset; one has an ALE of 80 years and the other has 100years.
- Access & Boundary Control, Handrails and Pedestrian Balustrade: A metal handrail has an ALE of 80 years, whilst the balustrade is limited to 35 years. The 80 years appears to be over generous, especially if it is attached to the balustrade which will fail first.

The last example highlights a point that was made by the Amey surveyor that there is no opportunity to record the overall picture of the site as everything is considered in isolation. The example that was pointed out related to a drainage gutter attached to timber fascia board on a building. The gutter had been recently renewed and therefore was scored highly, however the timber fascia board it was attached to was in a state of disrepair and was clearly going to fail before the guttering did. It is understood from the discussion with the Network Rail Route Building Engineer that this issue is understood by Network Rail and under consideration.

As mentioned previously there were a number of instances where the ARL is recorded as being greater than allowed ALE. It is understood that the Atrium software that is used by the Network Rail surveyors does not have the ALE built into it which is why the surveyor can record an ARL for an asset that is greater than the ALE.

It was also noted by the Amey surveyor that for each measure there is a limit of one defect that can be added. Therefore, if there are a number of different defects on the same element, they have to be somehow grouped together. It is understood that OPAS system only includes defects if they are found over the majority of the asset. For example, if a 200m platform deck is noted as having an ARL of 40 years, but has a recorded defect of 10m scored at 1year, the system would ignore the defect and base the score on the ARL of 40 years.

As highlighted in Section 5.2.2 there were locations that had no survey on the OPAS system. The procedure for uploading data to OPAS is that once Amey has completed and checked their survey report it is then uploaded to OPAS for approval by Network Rail. It is our understanding that the report is still available for download during this approval period. The locations mentioned were selected for audit because an SSM or LMDC score was reported, however it is difficult to understand how this score was calculated without survey data.

5.4.2 LMDC

The procedure for calculating the LMDC score is described in Appendix B and includes the eleven key elements that are used in the calculation. The depot surveys that were audited whilst containing a lot of data did not provide a complete survey of the depot (i.e. cover all eleven elements) and were limited to depot sheds, carriage washers, inspection / maintenance pits and tank farm. There was no survey of wheel lathes, gantry cranes or more notably, track. Other buildings outwith the depot sheds were identified on the survey drawing but did not form part of the survey. The measures within the depot shed included internal and external lighting, shed doors, superstructure and facilities and

accommodation. Although they are grouped together within the depot shed measure, they could be separated out to their respective elements for calculation of the LMDC.

The issues found as part of the SSM audit regarding the impact the documented Asset Life Expectancy apply to the LMDC. This is based on our belief that the ALEs apply equally to depots as to stations. As such we have identified a certain level of 'improvement' in certain of the individual asset conditions as a result.

It is our impression that the assessment of the LMDC has not kept pace with the development of the SSM and as such it is believed that there may require to be a greater focus on this measure during the next round of audits. This is clear from the review of the level of detail held in OPAS for the depot sites.

5.5 Conclusions

As described above, the methodology used during the site inspections was different to that employed in the previous review of KPI 6(c). The greater level of understanding of the algorithm employed by Network Rail to evaluate the Station Stewardship Measure allowed us to target the key factor on site during the inspections. The result has been that the level of variations from the site observations has been considerably reduced to that previously reported (down from 17% to 8%). This greater understanding has allowed the Reporter team to work these variations through to derive the actual impact on the individual station SSM as reported. In each case the variation caused by the observations (both betterments and degradation) have been taken into consideration to derive the overall impact on the SSM.

The impact on the SSM was in the range of -6% to +25%. This provides an average of a +6% variation in SSM score.

The view that the variations were due to some deficiency in the original survey process is supported by the fact that there does not appear to be any correlation linking the instances of under-reported measures against the date of the original survey.

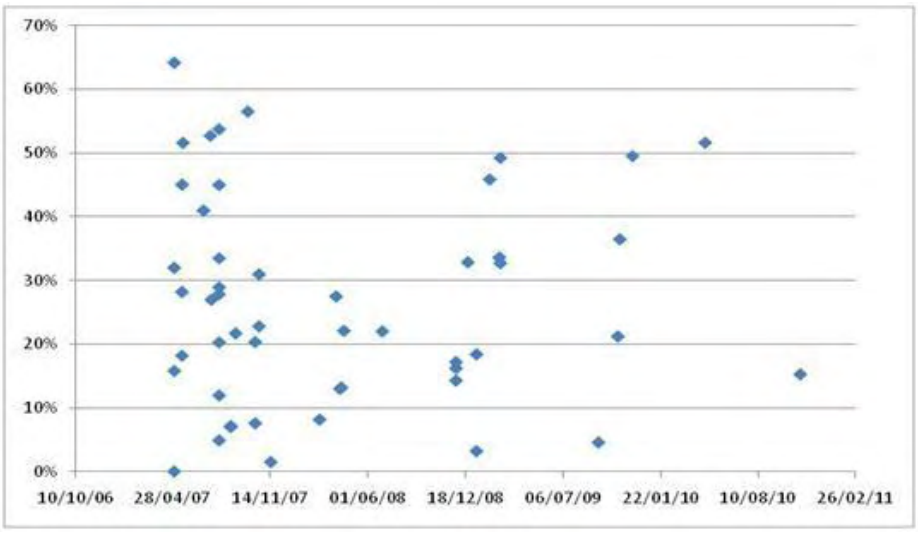


Figure 5.8: Plot of Proportion of Pessimistic SSM against Original Survey Date

Figure 5.8 shows a plot of the percentage variation found during the audit against the date of the original Network Rail survey. Whilst there is a cluster of results in 2007 which are widely spread there is no strong evidence of the variation lessening with more recent surveys. This tends to suggest that it is not occurring as a result of work taking place on site in the interim which is then impacting on the measure.

The ALEs which have been used by the Reporter team during the audit were those built into the system at the inception of SSM. They have not been amended in the intervening period and thus all site survey data lodged in OPAS from 2007 will have been measured against these figures to derive the Asset Condition Rating. If an individual surveyor was not aware of the ALE and the associated condition bandings he may well record a remaining asset life which leads to the generation of a different ACR from that intended. We saw no evidence of individual surveyors using or having knowledge of the ALEs used to drive the SSM calculation.

As a result, it is our view that for all categories the SSM scores are typically being reported at 6% below their correct level. Compared to the figures reported in the Annual Return for 2010 the impact would be as shown in Table 5.5.

Station Category	Reported 2009/10 SSM	Revised SSM	Regulatory Target (minimum average score at end of CP4)
A	2.28	2.15	2.48
B	2.40	2.26	2.60
C	2.47	2.33	2.65
D	2.53	2.39	2.69
E	2.52	2.38	2.74
F	2.54	2.40	2.71
Scotland	2.24	2.11	2.39

Table 5.5: Impact on Station Category Scores

In terms of the impact of this apparent gap it is possible, to re-align the survey results to correct this variation however the original targets for SSM were set independently to any process taking place on site and would therefore appear not to be linked to this variation. In this regard, it is our understanding that the SSM targets were set to provide a level of asset condition which met decent quality requirements whilst providing a level which Network Rail could reasonably sustain over time. This is clearly not linked to any variations in the level of ARL recorded by on site surveyors.

The intended programme of depot inspections was upset by the finding of only limited detail in one survey and the lack of any form of asset measurement for another. This highlighted that some LMDC are currently based on the previous methodology which is understood to be less detailed than current requirements and certainly those applied to the majority of stations. On further investigation the scale of the limited data became apparent.

For the two depots with current asset condition assessments that were audited variances of +1% and +12% were identified. Despite the limited sample there is a

strong similarity in the site observations with those of the SSM. This included similar variations in the assumed residual life for assets common to the two types of facilities. However, it would appear that unlike the 'ADC Lite' process, which was used to rapidly populate the database to support the SSM reporting, the LMDC evaluation appears in many cases to contain assessments based on a previous methodology. It is considered that this diminishes the quality of the reporting since it appears to be derived without the rigorous assessment of the individual assets making up the depot.

From the very limited sample of audits we consider that an average variation of some 6% could apply across the LMDC scores. This figure is based on the outcome of the two depot surveys and ties into the figure for the SSM outcome. If these figures were applied to the LMDC reported in the Annual Return 2010 the impact would be as shown in Table 5.6

Light Maintenance Depot	Reported 2009/10 Results	Revised LMDC	Delivery Plan Target (minimum average score at end of CP4)
England and Wales	2.47	2.33	2.52
Scotland	2.65	2.50	2.56
All LMDs	2.50	2.36	2.52

Table 5.6: Impact on Station Category Scores

5.6 Assessment of Confidence Ratings

With regard to the Station Stewardship Measure it is seen that there are good processes in place to evaluate station condition and these should provide a good set of results on which to evaluate asset condition. The publication of the Asset Life Expectancies in this way allowed the Reporter team to replicate the described processes as accurately as possible on site. The Reporter team believe that this exposed some variations in the judgements of ALE by previous surveyors. The result was that elements judged in good order have thus had their ALE increased leading to improvements in the associated SSM scores.

Given the range of variation the Station Stewardship Measure a Confidence Rating is 'B3'. This is an improvement from the rating awarded in 2009/10 of 'C4'. The improvement in the reliability has come about through the sharing of the algorithm and the recent publication of the SSM guidance note which has clarified the process and will, we believe, lead to greater consistency in the process. However, whilst the process may be clearer we remain of the view that the accuracy of the reporting is no better than +/-25% at the extreme but averaging less than 10% variation in SSM overall. We believe that the maximum that could be achieved with this measure would be to reach an 'A2' confidence rating.

The picture is similar for the LMDC which, despite the lower sample, resulted in variations of +1% to +12%. The LMDC Confidence Rating is 'C4'. This is a slight improvement from the 2009/10 rating of 'C5'. The 'C' reliability scoring is due to the apparent significant number of sites relying on scores derived under the previous methodology. Considering the accuracy measure the fact that there are only two results means that averaging the result could be misleading. Given that for the sites visited a number of the key blocks were missing from the survey, and

one example showed a variation of greater than 10%,the accuracy is given as a '4'. In a similar way to the SSM, it is believed that the potential score with LMDC is 'A2'.

5.7 Recommendations

Table 5.7 contains our draft recommendations. These recommendations are combined, in Section 7, with those for the other KPIs under consideration in this report, in order to provide an overview of the recommendations made in the current Quarter.

Number	Recommendation to Network Rail	Locations in Text	Network Rail Data Champion	Due Date
2011SSM01	Consider possible updates to the system in OPAS such that ARLs greater than ALE cannot be input	Section 5.4	John Chappell	March 2011
2011SSM02	Provide a more complete explanation of how ALE is derived in the Guide and review current listing to remove any discrepancies	Section 5.4	John Chappell	May 2011
2011SSM03	Review whether the recording system should be updated to allow for greater than one defect per recorded element	Section 5.4	John Chappell	May 2011
2011SSM04	Issue guidance on LMDC assessments similar to the recent SSM note including a review of the asset weightings	Section 5.4	John Chappell	May 2011
2011SSM05	Prioritise the detailed assessment of depots particularly where no current is held in OPAS	Section 5.4	John Chappell	September 2011

Table 5.7: SSM and LMDC Recommendations

6 Assessment of Confidence Ratings

6.1 Confidence Grading System

The Reliability and Accuracy descriptions used to assess the KPIs covered in this Quarterly Report are shown in Tables 6.1 and 6.2.

Reliability Band	Description
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment. Appropriate levels of internal verification and adequate numbers of fully trained individuals
B	As A, but with minor shortcomings. Examples include old assessment, some missing documentation, insufficient internal verification, undocumented reliance on third-party data.
C	Some significant shortcomings in the process which need urgent attention.
D	Major shortcomings in all aspects of KPI: process unfit for purpose

Table 6.1: Confidence Grading System: Reliability

Accuracy Band	Description
1	Calculation processes automated (to a degree commensurate with dataset size); calculations verified to be accurate and based on 100% sample of data; external data sources fully verified. KPIs expected to be accurate to within ±1%
2	KPIs expected to be accurate to within ±5%
3	Shortfalls against several attributes: e.g. significant manual input to calculations or incomplete data verification or less than 100% sampling used. KPIs expected to be accurate to within ±10%
4	KPIs expected to be accurate to within ±25%
5	Calculation processes largely manual with significant errors; data inconsistently reported and unverified; KPI based on small data sample or cursory inspections and verbal reports. KPIs unlikely to be accurate to less than ±25%
X	KPI is calculated on a very small sample of data, or accuracy cannot be assessed for some other reason (to be qualified in text of report)

Table 6.2: Confidence Grading System: Accuracy

Compatible Confidence Grades				
Accuracy Band	**Reliability Band**			
	A	**B**	**C**	**D**
1	**A1**	N/A	N/A	N/A
2	**A2**	**B2**	**C2**	N/A
3	**A3**	**B3**	**C3**	**D3**
4	**A4**	**B4**	**C4**	**D4**
5	N/A	N/A	**C5**	**D5**
X	**AX**	**BX**	**CX**	**DX**

Table 6.3: Confidence Grading Compatibilities

A graphical interpretation of the gradings is included in the following Section.

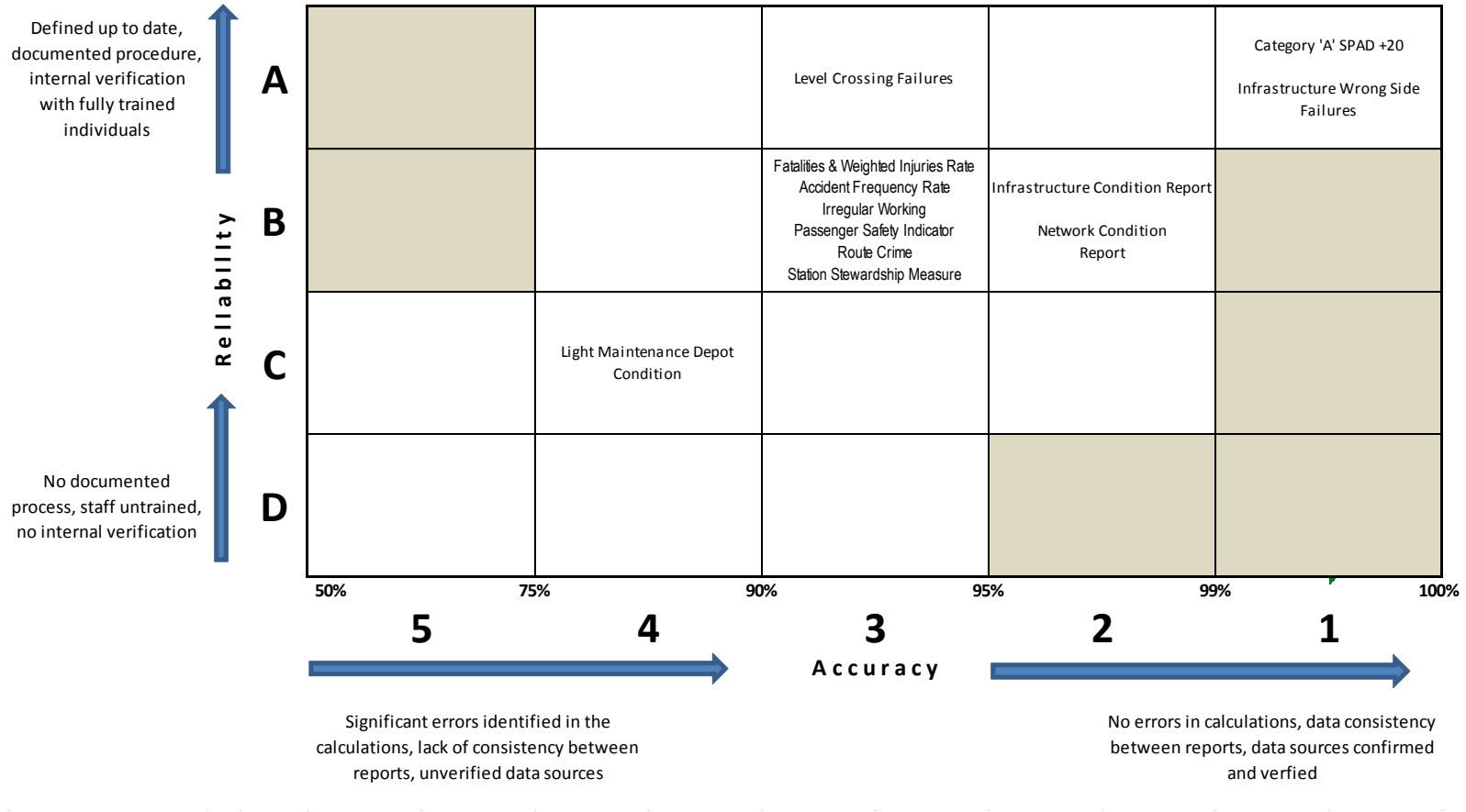
6.2 Confidence Ratings Achieved

Our confidence ratings for the Quarter 3 KPIs are summarised below in Table 6.4, and their values are represented graphically in Figure 6.1.

Heading	Measure	Confidence Rating
KPI 1: Safety	Fatalities and Weighted Injuries Rate	B3
	Accident Frequency Rate	B3
	Passenger Safety Indicator	B3
	Category 'A' SPADs +20	A1
	Irregular Working	B3
	Infrastructure Wrong Side Failures	A1
	Route Crime	B3
	Level Crossing Misuse	A3
Infrastructure Condition Report / Network Condition Report		B2
KPI 6c: Asset Management	Station Stewardship Measure	B3
	Light Maintenance Depot Condition	C4

Table 6.4: Summary of Reviewed Measure Confidence Ratings

Figure 6.1: Confidence Ratings Matrix



7 Recommendations

The table below contains a combined set of draft recommendations for ORR, to be discussed with the responsible Data Champions prior to the issue of our final Q3 report, and provides the basis for a work plan and schedule to be agreed with Network Rail. It also contains the outstanding recommendations from 2009/10. This year's recommendations are numbered 2011.1.1, 4.1, etc. to reflect the current year and the relevant KPI numbers.

Number	Recommendation to Network Rail	Locations in Text	Network Rail Data Champion	Due Date
2011SAF01	Implement a robust internal verification processes for accident reports to identify any shortcomings in reporting or classification.		Rod Reid	April 2011
2011SAF02	Standardise the requirements for near miss/close call reporting. Several different processes are being developed and these should be unified.		Rod Reid	April 2011
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	June 2011
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	June 2011
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	March 2011
2011SAF06	Review the definitions and management of Irregular Working, in particular improving the classifications and initial reporting to improve real time management.		Rod Reid	June 2011
2011NCR01	Complete discussions with ORR to resolve asset reporting	Section 4.2	Mary Jordan	March 2011

	requirements.			
2011NCR02	Correct minor discrepancies in 'traffic light' functionality in Part 2 ICR spreadsheet.	Section 4.3.3.2	Mary Jordan	March 2011
2011SSM01	Update system in OPAS such that ARLs greater than the ALE cannot be input	Section 5.4	John Chappell	March 2011
2011SSM02	Provide a more complete explanation of how ALE is derived in the Guide and review current listing to remove any discrepancies	Section 5.4	John Chappell	May 2011
2011SSM03	Review whether the recording system should be updated to allow for greater than one defect per recorded element	Section 5.4	John Chappell	May 2011
2011SSM04	Issue guidance on LMDC assessments similar to the recent SSM note including a review of the asset weightings	Section 5.4	John Chappell	May 2011
2011SSM05	Prioritise the detailed assessment of depots particularly where no current is held in OPAS	Section 5.4	John Chappell	September 2011

Table 7.1: 2010/11 Q3 Report Combined Recommendations

Appendix A

Record of Joint Survey with Amey

Minutes

ARUP

Project title	ORR Part A Independent Reporter	**Job number**	209830-82
Meeting name and number		**File reference**	
Location	Thirsk Station	**Time and date**	10:30 4 November 2010
Purpose of meeting	Review Amey Site Survey Processes	**Page 1 of 2**	
Present	Amey Surveyor, Grant Hainey, Douglas Leeming		
Circulation	those present Mark Rose		

Action

1. Purpose

The purpose of the meeting was to establish the practices used by Amey on site to undertake the surveys which feed into OPAS and are used to build the SSM score for any station.

The meeting involved observing and questioning an Amey surveyor during their site inspection at Thirsk station.

2. Survey Continuity

It was clear that the surveyor was familiar with the current Network Rail guidance on the process although was unaware of the latest issue of the Asset Reporting Manual. This is important in establishing a level of continuity of the Asset Life Expectancy (ALE). However, these figures should be well within the competency of a surveyor to accurately assess and thus this was not considered to be an issue. It was also noted that the Manual had only been issued a matter of weeks before the date of the meeting.

3. Survey Updates

A statement was made that the level of detail in previous studies was such that it was sometimes difficult for the Amey surveyors to establish individual elements to validate results. This was due to the limited amount of asset description provided in the earlier reports. (This view is confirmed by the Arup findings when seeking to validate survey results on the independent inspections where it is not always clear how given assets have been divided up.) The result of this is that there is a degree of reworking of the surveys to get to the point where Amey personnel are satisfied that the results provide a well structured and complete picture of the station asset condition. It is noted that the software will accept an Asset Remaining Life (ARL) greater than the ALE for any item.

4. Asset Condition Assessment

We sought to check what assumption was made regarding the asset condition and the future maintenance of any given item. It was stated that the working assumption is that each item will not receive any maintenance attention and that the ARL should be based on that fact. This provides a pessimistic view of any ARL but may not be unrealistic in the majority of cases.

5. Asset Systems

A comment was made to the effect that the breaking down of a station to individual asset level means that the overall 'system' is ignored – an example would be a new pvc gutter fitted to a rotten wooden facia board. During the surveys an assessment is made of the individual elements but the overall worthiness of the 'system' is not considered.

6. Survey Ownership

It is clear that the data at any given station will rely on input from a number of surveyors. This is a factor of the specialist M&E skills required and the requirement to undertake some work under possession, possibly at a date distant from the other elements in the survey. There also appears to be some instances when the 'fabric' elements of a survey are reviewed on different dates and there is therefore the potential to overlap the surveys. This should however be picked up when the survey comes together when the individual inputs build to form the overall station survey. One surveyor would appear to 'own' the survey but there seemed to be little checking between contributors at site level. This may not be an issue if there is sufficient checking taking place centrally.

7. Survey Programming

The indication was that the programming of surveys is undertaken centrally and that individual surveyors are given a programme of sites to visit. This planning of the sites by an HQ Delivery Manager allows more control of the booking of possessions in a co-ordinated fashion and would appear to be a sensible approach albeit removing some of the autonomy of the individual surveyors.

8. Survey Quality Assurance

The checking of the survey results is undertaken centrally. As a result a further meeting will be arranged in due course to understand this process. DL

Appendix B

Station Stewardship Measure and Light Maintenance Depot Condition Calculations

B1 Station Stewardship Measure Calculation

The SSM is a score given to each station as a representation of its overall condition and each category of station has a minimum SSM that must be maintained. These are shown in Table B1.

Station Category	Station Stewardship Measure (minimum average score at the end of CP4)
Category 1: National Hub	2.48
Category 2: Regional Hub	2.60
Category 3: Important Feeder	2.65
Category 4: Medium Staffed	2.69
Category 5: Small Staffed	2.74
Category 6; Small un-staffed	2.71
Scotland- All Stations	2.39

Table B1: SSM Target Scores

The process for calculating the SSM for a particular station is as follows;

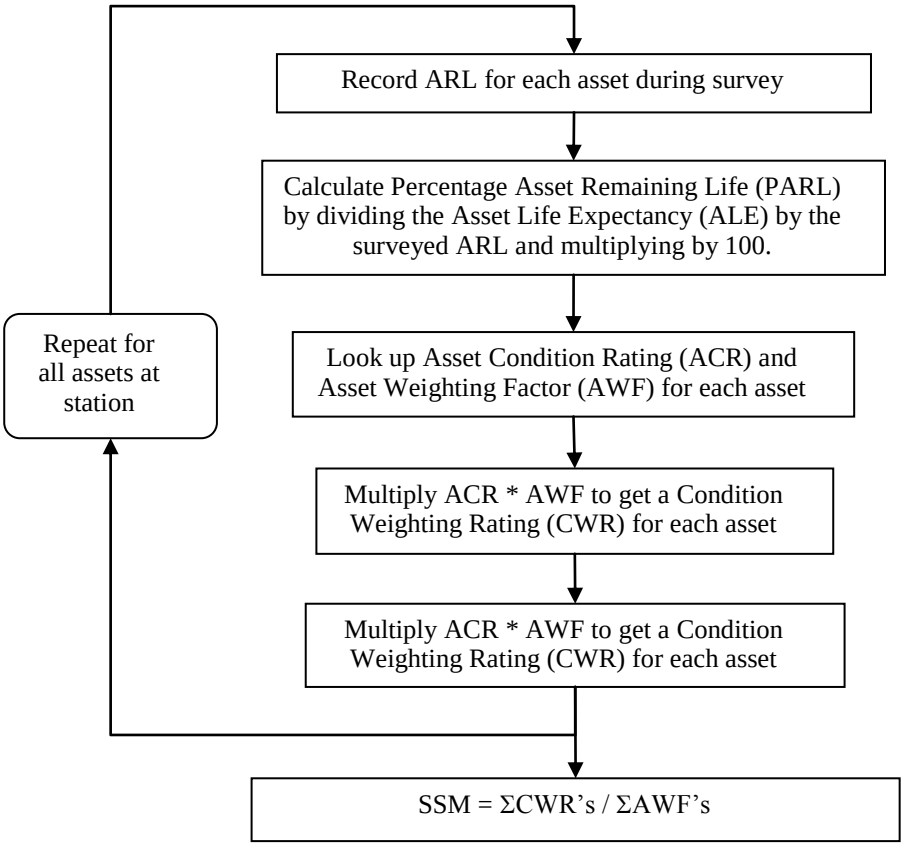


Figure B1: Station Stewardship Measure Calculation Process

Each station is made up of individual blocks e.g. Platform 01, Building 05 etc[2] and then surveyed as a list of measures within each block.

Each asset measure has been assigned an AWL on a scale of 1 to 5 to reflect the relative importance of the asset on the operational use of the station, with 1 being less significant and 5 being very significant.

For example, platform copers are rated 5, whilst a cycle rack is rated 1 as it would have minimal impact on the operation of the station compared to the copers.

Each asset measure has also been assigned an ALE. The life expectancy of each asset is graded into five bandings which are based on a percentage of the maximum ALE.

The bandings are split as detailed in Table B2.

Percentage of Asset Life Expectancy	Asset Condition Rating
100% to 76%	1
75% to 46%	2
45% to 16%	3
15% to 1%	4
0%	5

Table B2: Asset Condition Rating Bandings

Each asset is then assigned an ACR depending on the measured ARL expressed as a percentage of the ALE (PARL).

Using this procedure for each asset, the overall condition of the station can be expressed as an SSM score.

B1.1 Example

At a station, a precast concrete platform coper has been measured as having an ARL of 40 years.

From the tables, this asset has an ALE of 80 years and an AWF of 5.

An ARL of 40 years gives a PARL of 50% therefore the ACR is 2.

The CWR = ACR * AWF = 2 * 5 = 10.

If the entire survey was only this measure, the SSM would equal 10/5 = 2.0

[2] Refer to Network Rail Document NR/L1/CIV/006/11B - Handbook for the examination of Structures Part 11B: "Reporting and recording of examinations of Operational Property Structures and inspections of Buildings in OPAS"

B2 Light Maintenance Depot Condition Calculation

The asset condition ratings are split into five bands using the same percentage bandings as the stations as shown in Appendix B Table 2.

Whilst the station scores include all assets and apply an Asset Weighting Factor to them depending on their individual significance in relation to the operational use of the station, the depot score is limited to the condition of 11 elements.

These are:

1. Track;
2. External Lighting;
3. SHORE Supply;
4. Fuelling Facility;
5. Carriage Washer;
6. Wheel Lathe;
7. Gantry Crane;
8. Shed Doors;
9. Internal Lighting;
10. Superstructure; and
11. Facilities and Accommodation.

These eleven assets represent the majority of investment at the depots and those that most influence the functionality of the depot.

The score for the depot is the result of all the condition ratings for each element added together and divided by the number of elements in the depot. Not all depots will have all elements and some will have more than one of the same asset, e.g. two carriage washers. Where this is this case the average score is taken for the carriage washer element by adding up the score for each instance of the element and dividing by the number of instances i.e. (score of carriage washer 1 + score of carriage washer 2) / 2.

Appendix C

Summary of Station Stewardship Measures and Light Maintenance Depot Condition Audit Results

C1.1 Station Stewardship Measure Audit Results

SUMMARY

Station	Category	Date	% Checked	% Pass	Survey Measures	Audit Measures	OK	ARL	MAT	LAY	Notes
Inverness	B	08/11/2010	48%	92%	166	79	73	2	1	4	
Milngavie	D	09/11/2010	54%	98%	301	163	160	3	0	0	
Bearsden	E	09/11/2010	71%	96%	264	188	180	6	2	0	
Hillfoot	F	09/11/2010	88%	95%	156	137	130	2	3	2	
Windermere	E	10/11/2010	46%	98%	186	86	84	1	1	0	
Whitehaven	E	10/11/2010	41%	92%	320	132	121	10	0	1	
Workington	E	10/11/2010	50%	91%	140	70	64	3	1	2	
Larbert	E	11/11/2010	71%	94%	433	132	121	8	8	1	
Shettleston	D	11/11/2010	65%	96%	350	227	218	8	1	0	
Cumbernauld	E	11/11/2010	61%	88%	70	43	38	3	2	0	
Croy	E	11/11/2010	88%	92%	101	89	82	4	3	0	
Carntyne	F	12/11/2010	57%	100%	135	77	77	0	0	0	
Bellgrove	F	12/11/2010	80%	93%	93	74	69	3	0	2	
Hartlepool	D	15/11/2010	35%	62%	662	231	143	3	4	81	
Seaton Carew	F	15/11/2010	86%	81%	49	42	34	4	0	4	
Billingham	F	15/11/2010	75%	96%	64	48	46	0	0	2	
Barnsley	C	16/11/2010	86%	94%	269	230	216	3	0	11	
Dodworth	F										Replaced by East Garforth
Meadowhall	D	16/11/2010	69%	96%	757	524	505	15	4	0	
Skegness	E	17/11/2010	68%	92%	188	128	118	4	6	0	
Boston	E	17/11/2010	86%	95%	309	266	254	5	3	4	
Heckington	F	17/11/2010	87%	94%	78	68	64	2	1	1	
Havenhouse	F	17/11/2010	87%	80%	46	40	32	2	2	1	
Stockport	A	18/11/2010	66%	95%	487	322	307	5	6	4	ORR present during survey
Salford Crescent	C	19/11/2010	80%	85%	69	55	47	6	1	1	
Bolton	C	19/11/2010	47%	93%	1381	644	597	18	8	21	
Fenchurch Street	A	22/11/2010	66%	52%	185	123	64	48	4	7	ORR and NR present during survey
Littlehaven	E	23/11/2010	70%	97%	213	150	146	1	1	2	
Spooner Row	F										Replaced by Camelon
Faygate	F	23/11/2010	97%	81%	76	74	60	13	1	0	
Warnham	F	23/11/2010	94%	93%	71	67	62	5	0	0	
East Croydon	B	24/11/2010	85%	90%	358	304	273	26	4	1	
Chipstead	E	24/11/2010	85%	96%	97	82	79	3	0	0	
Pangbourne	E	25/11/2010	66%	86%	505	334	287	43	2	2	
Goring & Streatley	E	25/11/2010	82%	89%	711	585	520	32	5	28	
Culham	F										Replaced by Cholsey
Cholsey	E	25/11/2010	87%	99%	178	155	154	0	0	1	Replacement for Culham
Reading West	F	25/11/2010	69%	98%	193	133	130	0	1	2	
B'ham Moor Street	B	26/11/2010	74%	90%	129	96	86	1	8	1	ORR present during survey
Bordesley	F										Replaced by Goostrey
Weymouth	C	30/11/2010	93%	97%	229	214	207	6	0	1	
Paignton	C	01/12/2010	50%	92%	795	398	368	23	3	4	
Totnes	D	07/12/2010	93%	95%	204	189	179	7	3	0	
Torre	F	07/12/2010	85%	98%	151	128	126	2	0	0	
Briton Ferry	F	08/12/2010	93%	97%	84	78	76	0	2	0	
Baglan	F	08/12/2010	80%	99%	114	91	90	0	1	0	
Port Talbot Parkway	D	08/12/2010	82%	96%	121	99	95	1	0	3	
Wymondham	F	08/12/2010	81%	99%	85	69	68	1	0	0	
Attleborough	F	08/12/2010	94%	100%	85	80	80	0	0	0	
Bangor	D	09/12/2010	78%	93%	184	144	134	0	2	8	
Conwy	F	09/12/2010	94%	90%	86	81	73	2	0	6	
Goostrey	F	10/12/2010	68%	98%	280	190	187	3	0	0	Replacement for Bordesley
East Garforth	F	10/12/2010	92%	87%	86	79	69	10	0	0	Replacement for Dodworth
Camelon	F	15/12/2010	99%	92%	155	153	141	3	8	1	Replacement for Spooner Row

	Total Measures	Measures Checked	Accepted Measures	Residual Life Disagreement	Material Disagreement	Layout Disagreement
TOTALS	12449	8191	7534	350	102	209

66%	92%	4%	1%	3%
Overall Survey Size	Accepted	Residual Life Disagree	Material Disagree	Layout Disagree
	of the Sample Population			
	95%	3%	1%	2%
	Accepted	Residual Life Disagree	Material Disagree	Layout Disagree
	of the Total Population			
	Note: Assumes all unchecked are correct			

C1.2 Light Maintenance Depot Condition Audit Results

SUMMARY

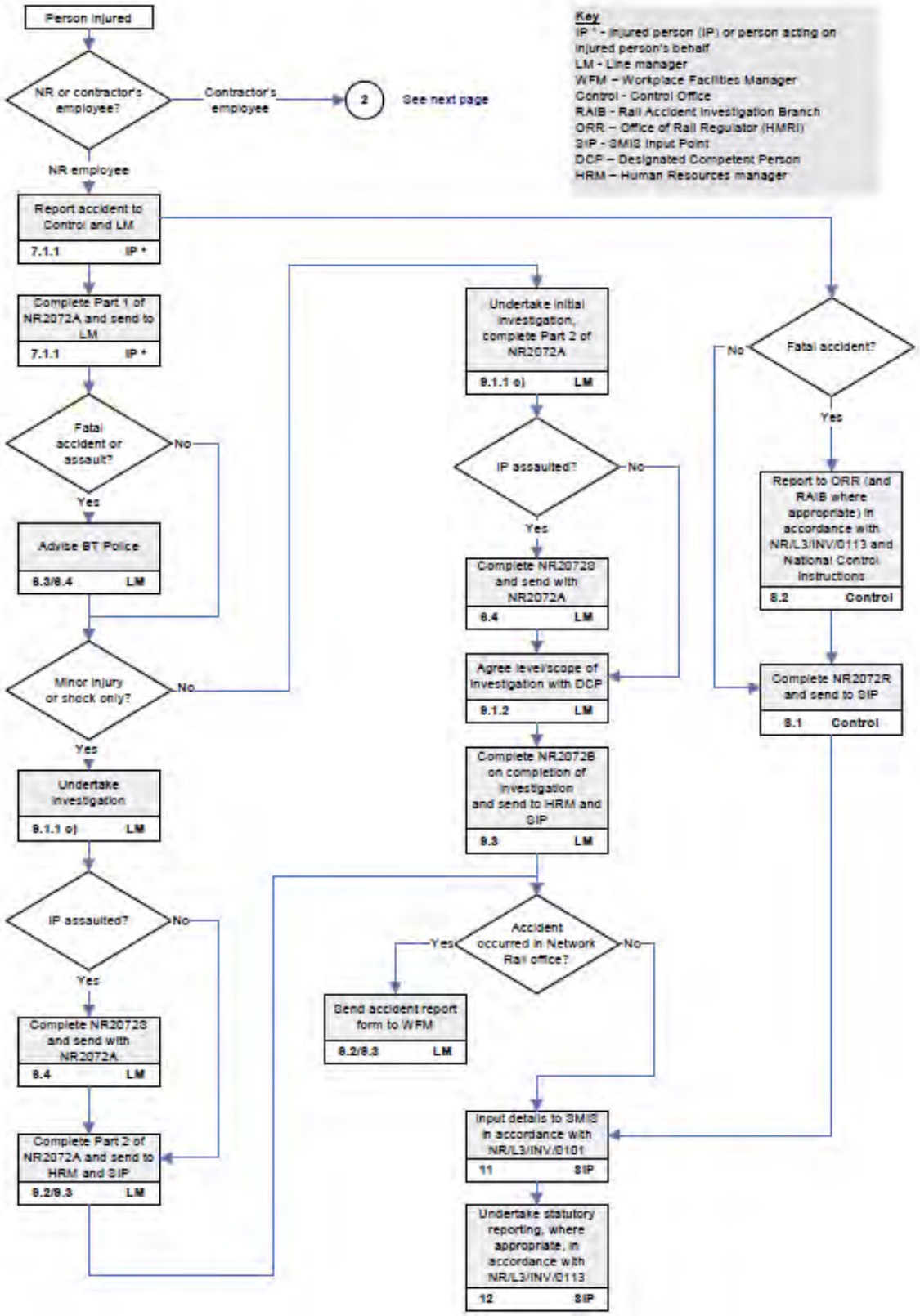
Station	Category	Date	% Checked	% Pass	Survey Measures	Audit Measures	OK	ARL	MAT	LAY	Notes
Hornsey		07/12/2010	52%	98%	1086	569	556	0	3	10	
Swansea		09/12/2010	69%	88%	735	504	443	34	18	9	
TOTALS					1821	1073	999	34	21	19	

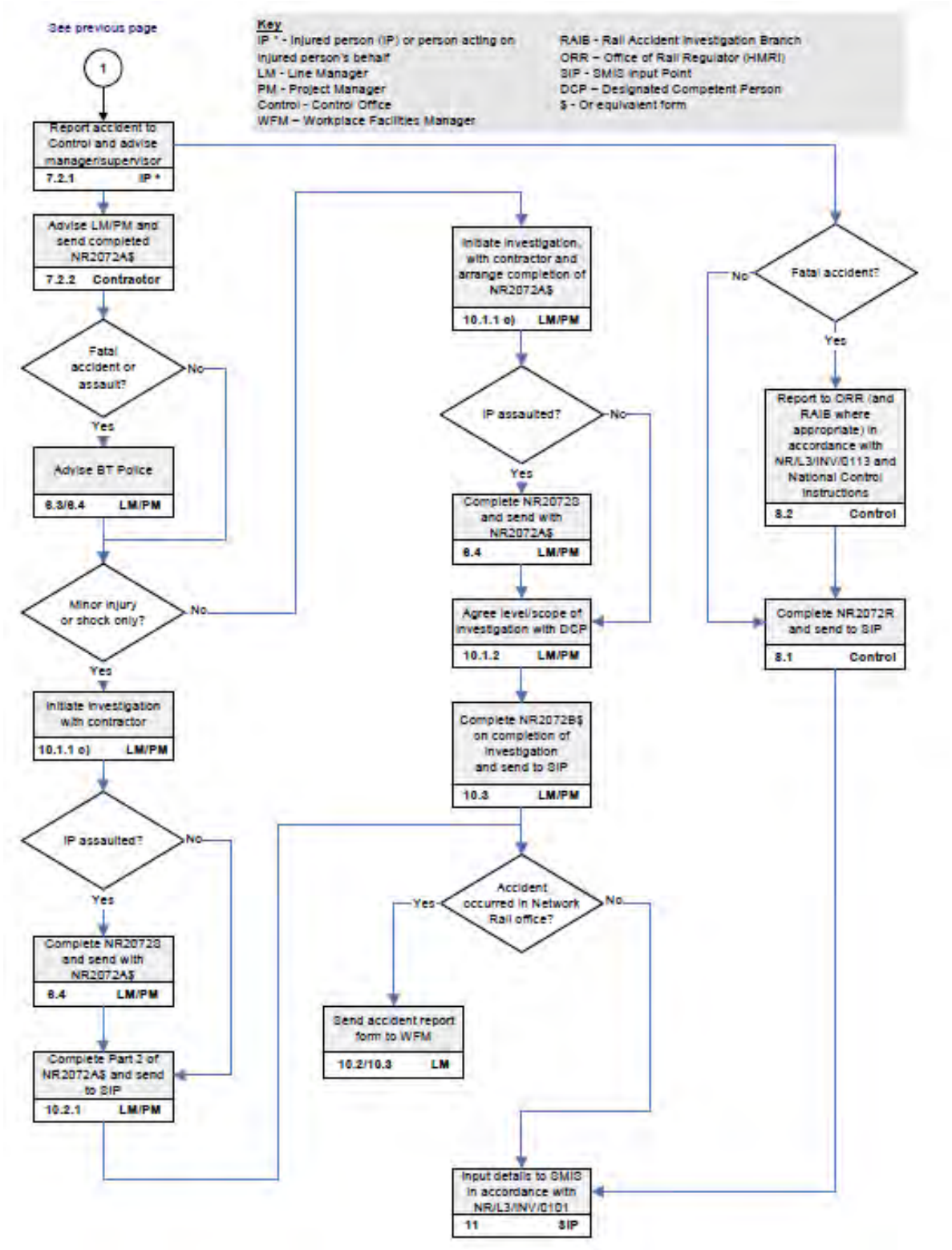
59%	93%	3%	2%	2%
Survey Size	Percentage Passed	ARL Failures	MAT Failures	LAY Failure
	of the Sample Population			
	96%	2%	1%	1%
	Percentage Passed	ARL Failures	MAT Failures	LAY Failure
	of the Total Population			
	Note: Assumes all unchecked are correct			

Appendix D

Personal Accident Reporting Flow Chart

14 Flowchart




See previous page
Key
IP * - Injured person (IP) or person acting on injured person's behalf
LM - Line Manager
PM - Project Manager
Control - Control Office
WFM – Workplace Facilities Manager
RAIB - Rail Accident Investigation Branch
ORR – Office of Rail Regulator (HMRI)
SIP - SMIS Input Point
DCP – Designated Competent Person
$ - Or equivalent form
1
Report accident to Control and advise manager/supervisor
7.2.1 IP *
Advise LM/PM and send completed NR2072A$
7.2.2 Contractor
Fatal accident or assault?
No
Yes
Advise BT Police
8.3/8.4 LM/PM
Minor injury or shock only?
No
Yes
Initiate investigation with contractor
10.1.1 o) LM/PM
IP assaulted?
No
Yes
Complete NR2072B and send with NR2072A$
8.4 LM/PM
Complete Part 2 of NR2072A$ and send to SIP
10.2.1 LM/PM
Initiate investigation with contractor and arrange completion of NR2072A$
10.1.1 o) LM/PM
IP assaulted?
No
Yes
Complete NR2072B and send with NR2072A$
8.4 LM/PM
Agree level/scope of investigation with DCP
10.1.2 LM/PM
Complete NR2072B$ on completion of investigation and send to SIP
10.3 LM/PM
Accident occurred in Network Rail office?
Yes
No
Send accident report form to WFM
10.2/10.3 LM
Fatal accident?
No
Yes
Report to ORR (and RAIB where appropriate) in accordance with NR/L3/INV/0113 and National Control Instructions
8.2 Control
Complete NR2072R and send to SIP
8.1 Control
Input details to SMIS in accordance with NR/L3/INV/0101
11 SIP

Appendix E

Record of Discussion with Network Rail Route Building Engineer (LNW)

Notes

ARUP

Project title	ORR Part A Independent Reporter	**Job number** 209830-82
Meeting name and number		**File reference**
Location	Telephone Conversation	**Time and date** 15:00 6 January 2011
Purpose of meeting	Review Network Rail Processes	**Page 1 of 3**
Present	Patrick Cawley, Douglas Leeming	

Action

1. Purpose

The purpose of the meeting was to review the processes associated with the planning and verification of the survey data in OPAS used to generate Station Stewardship Measures and Light Maintenance Depot Condition scores.

2. Planning of Surveys

It was confirmed that the planning of the site condition surveys was not done in isolation and relied heavily on being co-ordinated with other works and in particular planned renewals. It was stated that a survey would be planned ahead of renewal works rather than after when the condition of the asset would be known.

The surveys at stations and depots receive similar priority.

3. Detailed Survey Progress

It was stated that given the period since the start of detailed surveys were initiated the majority of station would now have progressed beyond the 'ADC lite' stage. It was confirmed that the detailed surveys should contain, for example, assessments of internal room surfaces and woodwork.

The lack of such detailed information was discussed at Salford Crescent and Stockport since based on the report made available to the Reporter team from OPAS this information was lacking and the reports had been dated from 2007. This raised a question over the

availability of current reports in the system.

4. Light Maintenance Depot Condition

The Reporter representative noted that a number of the sites which had been selected for audit had not been supported by any detailed survey within OPAS. The ability to rate these sites in the Annual Return had been stated to be based on the previous methodology until the detailed surveys caught up.

During the course of the conversation it was however noted that the majority of the depots on LNW had detailed surveys in place.

The Reporter team will therefore undertake a review of the overall detailed survey levels. DL

5. Amey Delivery

With regard to the LNW survey programme the following figures were noted:

SSM

Planned surveys 10/11: 116

Surveys completed to date: 53 (on programme)

Surveys submitted: 51

Surveys rejected: 4

LMDC

Planned surveys 10/11: 6

Surveys completed to date: 1 (on programme)

Surveys submitted: 1

Surveys rejected: 0

It was stated that all surveys are reviewed by Network Rail when submitted by Amey. Ten percent of the surveys are subjected to a more detailed site review.

The vast majority of the submitted surveys are reviewed within the thirty day window following submission however even those that fall outside this period can still be rejected in found deficient.

6. Visual Inspection

It had previously been stated that the quinquennial nature of the detailed surveys meant that they could only even be considered a

snap-shot and would be rapidly out of date. The Reporter team now understand that a visual inspection of the facilities is undertaken annually and these are uploaded to OPAS thereby keeping it more current that previously understood. It was stated that the annual inspection was limited to certain key elements only and would not necessarily take account of any investment at a particular location since their purpose was not primarily to update the SSM.

7. Survey Reworking

The Reporter representative repeated the comment made previously by Amey that the quality of the ADC Lite surveys was sometimes such that it was necessary for them to start a location's survey afresh. It was noted that this comment had not been made by Amey to Network Rail.