



Independent Reporter A

**Annual Return 2004
Final Report**

Halcrow Group Limited

Halcrow

1 Executive summary

Reporter's scrutiny and opinion

- 1.1.1 Network Rail has appointed Halcrow Group as Reporter A to provide reporting services to the Office of the Rail Regulator (ORR, now Office of Rail Regulation) on its Annual Return for East Anglia, London North Eastern, Scotland and Southern Regions together with associated Headquarter functions.
- 1.1.2 This report presents our views and analysis of Network Rail's Annual Return 2003/04 to the ORR. It follows our reports on previous Annual Returns, which can be found on the ORR website.
- 1.1.3 The Reporter, Jon Bateman, and the Reporting Team of technical and operational specialists have visited each of the four Regions and Network Rail HQ. The following areas were covered during the audit of the Annual Return.
- (a) A review of the quality of the process by which the Annual Return 2003/04 has been compiled (comparing Regional methods to the Asset Reporting Manual Definitions and Procedures), including identifying the procedures used by Network Rail to measure, collect, prepare, analyse and include data and information;
 - (b) An audit of the numerical data presented in the tables in the Annual Return 2003/04 and checks of, on a sample basis, the methods used by Network Rail for collating the reported data and examination of the audit trail from the data presented in the tables in the Annual Return to the source of the data to verify the quality and accuracy of the data. Evidence was collected to support this where necessary;
 - (c) Identification of assumptions that have been made, confirmation of why these have been made and reporting on assumption justification and any material impact on the figures reported.
 - (d) An assessment of the reported data against the regulatory targets.
 - (e) A review of the commentaries associated with each table in the Annual Return 2003/04;
 - (f) A review of the appropriateness of the confidence grades assigned by Network Rail to each measure;
 - (g) An examination of changes in data and performance from previous years' Annual Return data and identification of any material trends;
- 1.1.4 Our audits and analysis of the data provided enable us to present the following findings:
- (a) The data presented in the Annual Return 2003/04 has, on the whole, been collected and processed in a diligent manner.
 - (b) Network Rail generally comply with the procedures and guidance for the monitoring, collection and collation of the Annual Return data as agreed by the Regulator. With the exception of measure M2 track defects and the reconciliation against Business Plan (see later comments), we found only minor deviations which do not materially affect the reported data. However, there remain shortcomings in the internal auditing and checking of some of the measures which is a cause for concern.
 - (c) There remains potential for inconsistent assessment of condition for Bridge, Signalling and Electrification assets between and within Regions. This is further exacerbated by the lack of internal auditing and checking.
 - (d) While the Annual Return measures give a high level view of performance, we note that there is potential for some developments in the measures which, if carried out,

would allow a more detailed and reliable assessment of Network Rail's performance.

- (e) The accurate reporting of asset condition assessment measures is reliant on the experience and specific, independent knowledge of the engineers carrying out the assessments. Measures must therefore be established to ensure sufficient training, transfer of this knowledge or improved structuring of the assessment processes to reduce this reliance.

1.1.5 Network Rail have co-operated with the Reporting Team, providing relevant information and giving adequate time to the audit process.

Reporter's overview of the Annual Return 2003/04

1.1.6 Our audits took place contemporaneously with Network Rail's compilation of their Annual Return in May and June 2004. This meant some data was not available at the time of the audits limiting the level of investigation and verification that could be undertaken in the Regions.

1.1.7 Our 2004 audits focussed on the following aspects:

- (a) Verification of the source data for the reported measures with visits to "front line" Network Rail and IMC personnel and site visits to verify the primary data;
- (b) Verification of the full reporting process covering:
 - (i) Investigation into the reliability of condition assessments;
 - (ii) Examination of resource and competency constraints;
 - (iii) Assessment of compliance with procedures;
- (c) Evaluation of the effectiveness of the measures within the Annual Return to demonstrate the condition of the assets on the network and the performance of Network Rail;
- (d) Review of our 2003 Report findings and recommendations.

1.1.8 We provide below specific conclusions and observations. A detailed commentary of our findings for each section of the Annual Return is presented in our main report. We provide recommendations on how some measures could be further refined to more accurately reflect the condition of the network. We also give guidance designed to aid Network Rail to improve the reliability and accuracy of the data.

Operational performance

1.1.9 Operational performance has improved this year but not met the target of 13.25 million delay minutes for 2003/04. Actual delay minutes for the year were 13.7 million, which is some 3% higher than target, but nearly 7% down from 2002/03. This equates to a fall of 8.7% when normalised to reflect traffic growth over the year. The biggest reductions in delay minutes are in categories for 'Severe weather/ structures' (29% reduction) and 'Track defects & TSRs' (15% reduction).

1.1.10 We found the definitions and procedures underlying this measure (contained in the 'delay attribution guide') are subject to interpretation. This has led to differences in attribution practice between Regions which impacts both the reliability and accuracy of this measure.

Broken rails (M1)

1.1.11 Network Rail's commitment to reducing the number of Broken Rails across the network has once again resulted in a decrease in rail breaks. During the 2003/04 reporting year, 334 breaks were reported, which is over 50% better than the regulatory target and represents a 25% decrease against the 2002/03 figures. This reduction has been achieved through continued application of focused management processes across the Regions.

Defective rails (M2)

- 1.1.12 Following our recommendations last year, we note Network Rail is seeking to improve its data management for rail defects. The results of a data correction exercise has improved our confidence in the 2003/04 and 2002/03 data.
- 1.1.13 The number of isolated defects reported for 2003/04 is 31,301 compared with a corrected value of 27,892 defects for 2002/03. This represents a 12% year-on-year increase. However, whilst we found the Regions were compliant with the regulatory definitions and procedures for this measure, we have identified variations in interpretation of the supplementary standards for track defects which, we believe, has led one Region to significantly over-report this year.
- 1.1.14 The length of continuous defects reported for 2003/04 is 1,867km compared with a corrected value of 1,986km defects for 2002/03. This represents a 6% year-on-year decrease. Again, whilst we found the Regions were compliant with the regulatory definitions and procedures for this measure, we have identified variations in interpretation of the supplementary standards for track defects. This has, we believe, led one Region to over-report and one region to under-report this year.

Track geometry (M3)

- 1.1.15 Five of the twelve regulatory targets for track geometry (national standard deviation data) were met in 2003/04; the remaining seven fell short of the regulatory target. Network Rail is steadily improving the quality of track on the network.
- 1.1.16 For the first time in four years, a regulatory target in the 70m alignment (vertical deviation) track quality parameter has been met; this was for the 50% parameter. Vertical track geometry improved for all except one measure. The regulatory targets set for the 50% and 90% parameters for horizontal track geometry were again met, although the 2003/04 figures are lower than reported in 2002/03.
- 1.1.17 For the first time, the Annual Return 2003/04 presents a measure of poor track geometry. Network Rail report a poor track geometry score of 3.85%, which is 0.05% higher than the 2002/03 figure.

Track geometry – Level 2 exceedences (M5)

- 1.1.18 Network Rail report a network total of 1.113 Level 2 exceedences per track mile for the 2003/04 reporting year, 39% below the regulatory target. This continues the decreasing trend for Level 2 exceedences over the last four years. Plain line track has improved by a greater margin than S&C track. We note the relatively small amount of track measured in S&C imparts a disproportionately negative affect on the network totals for each year: 29% of Level 2 exceedences are caused by the 10% of track that is S&C.

Condition of asset temporary speed restriction sites (M4)

- 1.1.19 Following a 15% reduction in temporary speed restrictions (TSRs) in 2002/03, there has been a further reduction of 8% in 2003/04. This is in contrast with the severity scores which reduced by more than 20% in 2002/03 but reduced by only 1% this year. There were 1,199 TSRs on the network this year with a total severity of 6,089. Reported TSRs are dominated by track-related faults, accounting for around 90% of the total number and severity score.

Bridge condition index (M8)

- 1.1.20 The cumulative average condition grade for 2000-2004 is 2.0; this is unchanged from the previous grade of 2.0 for the period 2000-2003; condition grades range from 1 (good condition) to 5 (poor condition). Currently, 58% of bridges scored are in condition grade 2 whilst 79% are in the top two grades; 98% are in grades 1-3.
- 1.1.21 Accumulation of a full set of SCMI data for the structures population is programmed to take six years, completing in 2006/07. For the four Regions we audit, progress is 31% behind programme: East Anglia is 9% behind, Scotland is 14% behind, Southern is 44% behind and LNE is 40% behind.

- 1.1.22 We identified duplicated and missing entries in the SCMI databases in two Regions. We found personnel in the Regions were 'detached' from the data and showed a lack of 'ownership'. There is again a significant lack of internal audit to ensure consistency within and between the Regions; only one Region carried out routine re-scoring checks of condition assessments. There remain resource and support deficiencies in the majority of the Regions visited in addition to shortcomings in the training and competency of staff.

Signalling failures (M9)

- 1.1.23 The reported number of signal failures causing more than 10 minutes of train delay for 2003/04 is 28,098, which is almost 12% higher than the target and outside the tolerance of $\pm 7.3\%$. The regulatory target for signalling failures has not been met.
- 1.1.24 However, following a 16% increase between 2000/01 and 2002/03, there has been a 3% reduction this year. As we forecast in last year's report, this improvement is likely to have been caused by the TPWS equipment 'bedding-in'. The initial part of the 'bathtub curve' of asset performance has run its course, with improvements this year leading to reduced delays.
- 1.1.25 An error of 9% was internally identified in the delay attribution process in LNE and an internal review in East Anglia revealed that one quarter of delays attributed to signalling were not related to signalling failures, despite the allocation of delay being generally consistent with the delay attribution guide. The extent of variance between the delays recorded in TRUST and the engineers' view of delays caused by signalling gives us significant concerns about the ability of the measure to provide an accurate record of the impact of signal failures on operational performance.

Signalling asset condition (M10)

- 1.1.26 The average condition of signalling assets inspected has been falling over the last three years. The condition grade has increased from 2.3 in 2000/01 to 2.5 this year; condition grades range from 1 (good condition) to 5 (poor condition). This is due to an increase of assessments graded in band 3 and a decrease of assessments in band 2. However there are concerns regarding the robustness of the average score.
- 1.1.27 Whilst the Regions collect the signalling condition data in accordance with the relevant procedures, there are no mechanisms in place to ensure consistency between the Regions, within Regions or between the outputs of different methods used for calculating the condition grade.
- 1.1.28 There are shortcomings in the condition assessment tools including ambiguities in interpretation, caveats and dependencies to the scores which are not shown in the Annual Return data or reflected in the score.
- 1.1.29 The assessment relies to a large extent on the practitioner's experience and detailed knowledge of the assets. At present there are limited formalised knowledge and skills transfer processes in place to address the long-term implications of this.
- 1.1.30 As in previous years, Headquarters personnel have not undertaken audits and no formal training programmes are in place to ensure consistency between Regions. The score is an aggregate of three different methodologies, based on subjective assessments by more than one person with little evidence of training or audit regimes to improve consistency of application.
- 1.1.31 We note the extensive recommendations that we made last year have not been implemented.

AC and DC traction power incidents causing delay (M11 & M12)

- 1.1.32 For both measures, the number of incidents recorded this year is less than the number recorded in 2000/01 but higher than the lower tolerance bound for the measure. The reported figures show little change from last year.

- 1.1.33 We found an inconsistency in the source of data used to verify delay caused by a failure; two regions used management reports rather than the delay attribution database, which is refreshed to include reactionary delays.
- 1.1.34 We note that failures in plant and machinery are not reported upon in the Annual Return although they may significantly contribute to the delays on the network.

AC and DC electrification condition (M13 & M14)

- 1.1.35 The average condition score for both M13 and M14 is 1.9 which is an improvement on previous years. For both measures there has been a significant increase in assets categorised as condition grade 1 since 2000/01, which has been partly offset by a reduction in assets in condition grade 3. Condition grades range from 1 (good condition) to 5 (poor condition).
- 1.1.36 We believe the improved score is due to a more pro-active maintenance regime and a skewed inspection regime, where the assets in worst condition were assessed in the early years of the sampling programme.
- 1.1.37 During the HQ audit, we found several errors in the spreadsheet used to calculate the average condition score for M14. These were corrected prior to publication of the Annual Return and have therefore not impacted on the figures reported.
- 1.1.38 We note last year's recommendations for these measures have not been implemented.

AC and DC traction contact system condition (M15 & M16)

- 1.1.39 The condition of AC contact systems reported has improved this year from average score of 1.8 to 1.7. This is a further improvement over the score of 1.9 recorded in 2000/01. Condition grades range from 1 (good condition) to 5 (poor condition).
- 1.1.40 The condition of DC contact systems reported for measure M16 has remained constant since 2000/01 at 1.8. This is due to the low rate of inspection: only 16% of conductor rail wear measurements included within the measure have been undertaken since 2000. A large proportion of the information reported for this measure is therefore based upon old wear measurements, extrapolated to reflect an estimate of current wear.

Station condition index (M17)

- 1.1.41 The regulatory target for the station condition index is to maintain the average condition grade at 2.2. The national average condition grade reported for the complete portfolio is 2.25; the average score for the stations assessed this year is 2.29.
- 1.1.42 The station condition score gives equal weighting to all the different elements included in the assessment irrespective of their actual impact on customer perception and risk to operations and all stations are subject to the same assessment regardless of size.
- 1.1.43 The station condition score gives equal weighting to 34 different elements included in the assessment irrespective of their relative importance to customers or differing levels of maintenance and renewal expenditures. As we have previously recommended, this measure might be improved by a more representative scoring methodology.
- 1.1.44 Reporting procedures were generally compliant though, for the second year running, internal audits to assure consistency between regions and inspectors were not undertaken.

Station facility score (M18)

- 1.1.45 The station facility score has risen steadily by 4.8% over the last 3 years, representing an increase in counted assets from 173,447 to 181,778. This increase is dominated by the safety & security theme, which also accounts for over 61% of the total score.
- 1.1.46 As reported in previous years, we consider that this scoring system is weak, as the score focus entirely on quantity not on the availability, quality, condition or usefulness of the facilities

- 1.1.47 An internal audit to assure consistency between regions and inspectors was undertaken this year and a report of findings has been produced together with recommendations for the future management of the reporting process for the measure.

Activity volumes (M20-M29)

- 1.1.48 Track renewals volumes have increased this year. The reported rail renewals volumes have increased by 30% this year. Sleeper renewal volumes are up by 24% this year and 73% higher than the 2000/01 level. A similar trend is apparent for ballast, with renewals 25% greater than last year. Switch & crossing (S&C) renewals have increased by 50% on 2002/03 levels and are almost three times greater than the level reported in 2001/02.
- 1.1.49 We found the inclusion of maintenance volumes in track renewals volumes was inconsistent between Regions.
- 1.1.50 Following our recommendations from previous years, the definition for signalling renewals has been redefined to provide a more realistic measure of activity. Signalling renewals are now reported in terms of Signalling Equivalent Units (SEUs) renewed per annum. This is the first year this measure has been reported in the Annual Return. There has been a decrease in the number of SEUs renewed since last year from 1440 to 1120 SEUs.
- 1.1.51 The activity volumes reported are based on renewals projects undertaken by each Region during the reporting year. Projects are grouped into workbanks for each renewals category, representing a defined scope of works for each reporting year. We found that the proposals contained in the workbanks are changed during the year leading to a significant difference in the actual work carried out against the original forecast, despite consistency in overall volumes. We found in many cases that we were unable to fully reconcile each renewals workbank at the project level in a systematic manner, especially where projects were deferred or substituted for new previously un-budgeted projects. It is possible that this is due to our receiving incomplete datasets.
- 1.1.52 The accuracy of the numbers presented in the Annual Return suffers from minor shortcomings; however, based on the data provided by the Regions, we believe the figures presented reflect the levels of activity undertaken by the Regions.

Network capability (C1-C4)

- 1.1.53 The total kilometres of track reported for this measure between the 2001/02 and 2003/04 reporting years has reduced by 0.5%.
- 1.1.54 However the year on year variance between individual RA bands is more significant. Since 2001/02 there has been a significant change in the number of track kilometres classified as RA10, increasing by over 80% in 2002/03 but reducing by nearly 45% this year due to errors in the 2002/03 figures which have been subsequently corrected
- 1.1.55 The on-going cleansing and correction of data in MapInfo and the implementation of the GEOGIS Data Improvement Programme are the key contributing factors to the higher level of data accuracy reported in the Annual Return 2003/04.

Reconciliation for Business Plan 2003/04

- 1.1.56 Total network expenditure for 2003/04 was £5.2 billion, 16% higher than 2002/03. 61% was spent on renewals, 24% on maintenance and the remainder on network enhancements. Renewals expenditure has increased by 25% on 2002/03 levels.
- 1.1.57 We found Network Rail's project control and business planning systems did not provide the functionality required to report this measure disaggregated by route; Regional personnel use supplementary methods to manage and report expenditure levels for regulatory purposes. We were unable to reconcile some of the Regional data provided at audit (or thereafter) with the results in the Annual Return. It is possible that this is due to our receiving incomplete datasets.

Customer reasonable requirements

- 1.1.58 22 CRRs from three customers were submitted during the year. 71 CRRs from 24 customers were withdrawn or completed during the year, leaving 112 live CRRs at the close of the reporting year. A significant proportion of those withdrawn failed the SMART+f criteria (specific, measurable, achievable, relevant, time based, funded) which Network Rail's customer account teams have been using to validate existing CRRs.
- 1.1.59 We believe consideration should be given to expanding the CRR measure to incorporate other processes which demonstrate Network Rail's responsiveness and achievements in delivering for its customers.

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Halcrow Group Limited
Vineyard House 44 Brook Green London W6 7BY
Tel +44 (0)20 7602 7282 Fax +44 (0)20 7603 0095
www.halcrow.com

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Final Report

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Initial
1	0	Interim Report	02/08/04	DJM
2	0	Final Report (electronic version) incorporating Independent Reporter's comments	31/08/04	DJM
2	1	Final Report (electronic version) incorporating ORR comments	01/09/04	DJM
2	2	Final Report (printed version) incorporating Independent Reporter's comments	15/09/04	DJM
2	3	Final Report (web version) incorporating Network Rail's comments	08/10/04	DJM

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- 1.1.30 As in previous years, Headquarters personnel have not undertaken audits and no formal training programmes are in place to ensure consistency between Regions. The score is an aggregate of three different methodologies, based on subjective assessments by more than one person with little evidence of training or audit regimes to improve consistency of application.
- 1.1.31 We note the extensive recommendations that we made last year have not been implemented.

AC and DC traction power incidents causing delay (M11 & M12)

- 1.1.32 For both measures, the number of incidents recorded this year is less than the number recorded in 2000/01 but higher than the lower tolerance bound for the measure. The reported figures show little change from last year.

- 1.1.33 We found an inconsistency in the source of data used to verify delay caused by a failure; two regions used management reports rather than the delay attribution database, which is refreshed to include reactionary delays.
- 1.1.34 We note that failures in plant and machinery are not reported upon in the Annual Return although they may significantly contribute to the delays on the network.

AC and DC electrification condition (M13 & M14)

- 1.1.35 The average condition score for both M13 and M14 is 1.9 which is an improvement on previous years. For both measures there has been a significant increase in assets categorised as condition grade 1 since 2000/01, which has been partly offset by a reduction in assets in condition grade 3. Condition grades range from 1 (good condition) to 5 (poor condition).
- 1.1.36 We believe the improved score is due to a more pro-active maintenance regime and a skewed inspection regime, where the assets in worst condition were assessed in the early years of the sampling programme.
- 1.1.37 During the HQ audit, we found several errors in the spreadsheet used to calculate the average condition score for M14. These were corrected prior to publication of the Annual Return and have therefore not impacted on the figures reported.
- 1.1.38 We note last year's recommendations for these measures have not been implemented.

AC and DC traction contact system condition (M15 & M16)

- 1.1.39 The condition of AC contact systems reported has improved this year from average score of 1.8 to 1.7. This is a further improvement over the score of 1.9 recorded in 2000/01. Condition grades range from 1 (good condition) to 5 (poor condition).
- 1.1.40 The condition of DC contact systems reported for measure M16 has remained constant since 2000/01 at 1.8. This is due to the low rate of inspection: only 16% of conductor rail wear measurements included within the measure have been undertaken since 2000. A large proportion of the information reported for this measure is therefore based upon old wear measurements, extrapolated to reflect an estimate of current wear.

Station condition index (M17)

- 1.1.41 The regulatory target for the station condition index is to maintain the average condition grade at 2.2. The national average condition grade reported for the complete portfolio is 2.25; the average score for the stations assessed this year is 2.29.
- 1.1.42 The station condition score gives equal weighting to all the different elements included in the assessment irrespective of their actual impact on customer perception and risk to operations and all stations are subject to the same assessment regardless of size.
- 1.1.43 The station condition score gives equal weighting to 34 different elements included in the assessment irrespective of their relative importance to customers or differing levels of maintenance and renewal expenditures. As we have previously recommended, this measure might be improved by a more representative scoring methodology.
- 1.1.44 Reporting procedures were generally compliant though, for the second year running, internal audits to assure consistency between regions and inspectors were not undertaken.

Station facility score (M18)

- 1.1.45 The station facility score has risen steadily by 4.8% over the last 3 years, representing an increase in counted assets from 173,447 to 181,778. This increase is dominated by the safety & security theme, which also accounts for over 61% of the total score.
- 1.1.46 As reported in previous years, we consider that this scoring system is weak, as the score focus entirely on quantity not on the availability, quality, condition or usefulness of the facilities

- 1.1.47 An internal audit to assure consistency between regions and inspectors was undertaken this year and a report of findings has been produced together with recommendations for the future management of the reporting process for the measure.

Activity volumes (M20-M29)

- 1.1.48 Track renewals volumes have increased this year. The reported rail renewals volumes have increased by 30% this year. Sleeper renewal volumes are up by 24% this year and 73% higher than the 2000/01 level. A similar trend is apparent for ballast, with renewals 25% greater than last year. Switch & crossing (S&C) renewals have increased by 50% on 2002/03 levels and are almost three times greater than the level reported in 2001/02.
- 1.1.49 We found the inclusion of maintenance volumes in track renewals volumes was inconsistent between Regions.
- 1.1.50 Following our recommendations from previous years, the definition for signalling renewals has been redefined to provide a more realistic measure of activity. Signalling renewals are now reported in terms of Signalling Equivalent Units (SEUs) renewed per annum. This is the first year this measure has been reported in the Annual Return. There has been a decrease in the number of SEUs renewed since last year from 1440 to 1120 SEUs.
- 1.1.51 The activity volumes reported are based on renewals projects undertaken by each Region during the reporting year. Projects are grouped into workbanks for each renewals category, representing a defined scope of works for each reporting year. We found that the proposals contained in the workbanks are changed during the year leading to a significant difference in the actual work carried out against the original forecast, despite consistency in overall volumes. We found in many cases that we were unable to fully reconcile each renewals workbank at the project level in a systematic manner, especially where projects were deferred or substituted for new previously un-budgeted projects. It is possible that this is due to our receiving incomplete datasets.
- 1.1.52 The accuracy of the numbers presented in the Annual Return suffers from minor shortcomings; however, based on the data provided by the Regions, we believe the figures presented reflect the levels of activity undertaken by the Regions.

Network capability (C1-C4)

- 1.1.53 The total kilometres of track reported for this measure between the 2001/02 and 2003/04 reporting years has reduced by 0.5%.
- 1.1.54 However the year on year variance between individual RA bands is more significant. Since 2001/02 there has been a significant change in the number of track kilometres classified as RA10, increasing by over 80% in 2002/03 but reducing by nearly 45% this year due to errors in the 2002/03 figures which have been subsequently corrected
- 1.1.55 The on-going cleansing and correction of data in MapInfo and the implementation of the GEOGIS Data Improvement Programme are the key contributing factors to the higher level of data accuracy reported in the Annual Return 2003/04.

Reconciliation for Business Plan 2003/04

- 1.1.56 Total network expenditure for 2003/04 was £5.2 billion, 16% higher than 2002/03. 61% was spent on renewals, 24% on maintenance and the remainder on network enhancements. Renewals expenditure has increased by 25% on 2002/03 levels.
- 1.1.57 We found Network Rail's project control and business planning systems did not provide the functionality required to report this measure disaggregated by route; Regional personnel use supplementary methods to manage and report expenditure levels for regulatory purposes. We were unable to reconcile some of the Regional data provided at audit (or thereafter) with the results in the Annual Return. It is possible that this is due to our receiving incomplete datasets.

Customer reasonable requirements

- 1.1.58 22 CRRs from three customers were submitted during the year. 71 CRRs from 24 customers were withdrawn or completed during the year, leaving 112 live CRRs at the close of the reporting year. A significant proportion of those withdrawn failed the SMART+f criteria (specific, measurable, achievable, relevant, time based, funded) which Network Rail's customer account teams have been using to validate existing CRRs.
- 1.1.59 We believe consideration should be given to expanding the CRR measure to incorporate other processes which demonstrate Network Rail's responsiveness and achievements in delivering for its customers.

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3 Introduction

3.1 Background

- 3.1.1 As part of the ORR's Periodic Review of Network Rail's Access Charges a number of changes were be implemented for the Control Period 2001-2006 (CP2).
- 3.1.2 The ORR has implemented improvements in the information reporting arrangements of Network Rail through modifications to Network Rail's network licence. In summary, Network Rail is required:
- (a) To prepare more detailed regulatory accounts which are consistent with the basis on which the price controls are established;
 - (b) To ensure that enhancement expenditure is separately reported alongside information on those enhancements implemented;
 - (c) To appoint reporters (chosen by the Regulator in consultation with Network Rail) to provide an independent assessment of the robustness of Network Rail's information submissions; and,
 - (d) To provide an annual return (plus some monthly returns) to report data for the previous year and compares this with both historical data and baselines underlying the periodic review.
- 3.1.3 In accordance with these requirements, Network Rail now produces an Annual Return which contains data on operational performance, asset condition and serviceability, activity volumes, network capability, customer reasonable requirements and reconciles the forecast expenditure set out in the Business Plan against actual expenditure.
- 3.1.4 Halcrow was appointed as one of two Reporters for the network on 8th October 2002 and is described as Reporter A. The role of Reporter A is split into 2 parts:
- (a) Part A: Report to the Rail Regulator on Network Rail's Annual Return for East Anglia, London North Eastern, Scotland and Southern Regions and Network Rail HQ;
 - (b) Part B: Report to the Rail Regulator on Network Rail's Asset Register.
- 3.1.5 Halcrow are responsible for reporting on all of the measures in which the Regions are involved in the data collection and reporting process.
- 3.1.6 In addition there are four 'HQ Championed' measures in the Annual Return. The data collection and reporting for these measures is undertaken at Network Rail HQ.
- 3.1.7 The HQ Championed measures are:
- (a) M3 Track Geometry
 - (b) M5 Level 2 Exceedences
 - (c) M6 Slope Failures
 - (d) M19 Depot Condition.
- 3.1.8 Halcrow are responsible for reporting on the M3 Track Geometry and M5 Level 2 Exceedences measures.
- 3.1.9 This report is the Interim Report on Network Rail's Annual Return 2003/04 covering the 2003/04 financial year.

3.2 Scope

- 3.2.1 A programme of audits visits took place in May and June 2004 at Network Rail HQ, East Anglia, LNE, Scotland and Southern Regions. At each audit the personnel responsible for the collection and collation of the data for each measure were interviewed and the data collection systems, written documentation and supporting data made available were reviewed.
- 3.2.2 In order to gain the most value from the audit programme, questions and data requests for individual meetings were developed by our Audit Team in advance of the audits and provided to Network Rail.
- 3.2.3 The following areas were covered during the audit of the Annual Return.
- (a) A review of the quality of the process by which the Annual Return 2003/04 has been compiled (comparing Regional methods to the Asset Reporting Manual Definitions and Procedures), including identifying the procedures used by Network Rail to measure, collect, prepare, analyse and include data and information;
 - (b) An audit of the numerical data presented in the tables in the Annual Return 2003/04 and checks of, on a sample basis, the methods used by Network Rail for collating the reported data and examination of the audit trail from the data presented in the tables in the Annual Return to the source of the data to verify the quality and accuracy of the data. Evidence was collected to support this where necessary;
 - (c) Identification of assumptions that have been made, confirmation of why these have been made and reporting on assumption justification and any material impact on the figures reported.
 - (d) An assessment of the reported data against the regulatory targets.
 - (e) A review of the commentaries associated with each table in the Annual Return 2003/04;
 - (f) A review of the appropriateness of the confidence grades assigned by Network Rail to each measure;
 - (g) An examination of changes in data and performance from previous years' Annual Return data and identification of any material trends;

3.3 Programme of audit work

- 3.3.1 The audit programme was structured as follows:
- (a) HQ w/c 24 May 2004
 - (b) East Anglia w/c 7 June 2004
 - (c) Scotland w/c 14 June 2004
 - (d) Southern w/c 21 June 2004
 - (e) LNE w/c 28 June 2004
- 3.3.2 We have provided the details of all meetings and site visits attended by the Reporting Team in Appendix A.

4 Assessment of compliance

4.1 Compliance with requirements

Access to information and timing

- 4.1.1 Under the terms of our contract Network Rail are obliged to provide full access to data, information and personnel required for the Reporting Teams to carry out their audit.
- 4.1.2 We can confirm that we experienced necessary co-operation from Network Rail in organising and attending meetings and providing information necessary for preparation of our report.
- 4.1.3 We note, however, that due to the timing of the audits, not all of the data was available for some measures prior to or during the audit meetings.
- 4.1.4 We propose that in future audits the Reporting Team be provided with the most recent periodic data prior to the audits where final data is not available. Network Rail's checking procedures resulted in adjustments being made to the data until just a few days before the production of their Annual Return. In view of this we would propose that the 7-day period laid down in the contract for the Reporter's review of Annual Return data be extended to allow for a full and detailed reconciliation with the data provided in the Regions.

Audit organisation and preparation

- 4.1.5 The organisation by Network Rail for the audits in both HQ and the Regions was good and the timetable generally effective with some minor exceptions.
- 4.1.6 The extent of preparation for audits varied considerably between Network Rail personnel and Regions. In some regions it was clear that there had been significant preparation for most of the audits, with copies of the reported figures, local procedures, and in some cases, supporting audit trails provided before or at the meetings. In other cases, the preparation was much less complete.
- 4.1.7 During the audits, the Regional contacts were on hand to ensure the appropriate personnel attended the meetings and to help with any further requirements or questions.
- 4.1.8 As noted previously, our audits were carried out at the same time as final collation and checking of data by Network Rail at HQ and the Regions. Where data was provided prior to audits, we noted that in some instances revisions were ongoing at the Regions and HQ.
- 4.1.9 Whilst data control between the Regions and HQ is maintained through use of "sign-off" sheets, these were only available for all measures at the time of the audits in Southern and Scotland Regions.

4.2 Regulatory targets

4.2.1 Figure 4.2.1 shows Network Rail's performance against the regulatory targets for the measures reported in the Annual Return. The table also gives the statistical tolerances for each measure where applicable. Figure 4.2.1 does not include:

- (a) Those measures for which no regulatory target has been set.
- (b) Those measures for which baseline target levels will be established during the second control period once sufficient sample sizes are obtained.
- (c) Those regulatory targets for which no data is reported in the Annual Return.

Measure	2001/02 result	2002/03 result	2003/04 result	2003/04 target	Target tolerance
Ops performance (delay minutes per 100 passenger train km)	2.74	2.90	2.65	<1.32	-
Broken rails (M1)	535	444	334	<675	582-767
Track geometry standard deviations (M3)					
35mm Top (Vertical Deviation) 50%	62.4	61.9	62.4%	>64.6%	-
35mm Top (Vertical Deviation) 90%	89.4	88.9	89.2%	>90.3%	-
35mm Top (Vertical Deviation) 100%	97.1	97.0	97.0%	>98.3%	-
35mm Alignment (Horizontal Deviation) 50%	73.6	74.6	72.7%	>70.9%	-
35mm Alignment (Horizontal Deviation) 90%	93.1	93.6	92.9%	>91.6%	-
35mm Alignment (Horizontal Deviation) 100%	96.3	96.7	96.5%	>97.4%	-
70mm Top (Vertical Deviation) 50%	61.9	62.2	63.6%	>62.5%	-
70mm Top (Vertical Deviation) 90%	92.5	92.1	92.4%	>92.8%	-
70mm Top (Vertical Deviation) 100%	95.6	95.2	95.3%	>97.8%	-
70mm Alignment (Horizontal Deviation) 50%	80.0	80.9	79.5%	>64.7%	-
70mm Alignment (Horizontal Deviation) 90%	96.0	96.2	95.8%	>91.9%	-
70mm Alignment (Horizontal Deviation) 100%	97.4	97.5	97.2%	>97.3%	-
Track geometry level 2 exceedences per track mile (M3)	1.351	1.179	1.113	<1.820	1.693-1.947
Number of signalling failures (M9)	27,905	29,013	28,098	<25,106	26,938-23,273
Number of electrification failures – OHLE (M11)	107	102	79	<88	63-113
Number of electrification failures – conductor rail (M12)	30	32	33	<45	24-66
Station condition index – average condition grade (M17)	2.25	2.25	2.25	<2.2	2.1-2.3

4.2.2 Performance against regulatory targets shown in Figure 4.2.1 has not changed significantly in the 2003/04 reporting year compared to 2003/04 and 2003/02.

4.2.3 We would note the measures and regulatory targets reported by Network Rail in the Annual Return currently do not wholly align with the baseline outputs set out in Office of the Rail Regulator's *Periodic review of Railtrack's access charges: Final conclusions*, October 2000.

4.3 Confidence grades

- 4.3.1 Figure 4.4.1 shows the confidence grades our Reporting Team have assigned to the data in the 2003/04 Annual Return using the OFWAT grading system. Details of the OFWAT grading system are set out in Appendix B.
- 4.3.2 This year Network Rail has assigned confidence grades to their own measures in the Annual Return. We have made our own assessments of confidence grades based on our audit findings and have noted these in our commentary for each measure (Section 5). Where these substantially differ from those reported in the Annual Return we have identified an appropriate target confidence grade for future years.
- 4.3.3 We recommend that ORR and Network Rail agree target confidence grades for each measure for future Annual Returns and that Network Rail should develop an Action Plan for achieving these in each of the Regions.
- 4.3.4 The grades are expected to change during each audit cycle as each cycle adds to our understanding of Network Rail's reporting processes and allows a more comprehensive application of the confidence grading system; these grades should be viewed in conjunction with the individual audit reports and commentaries in Section 5 to understand the variations in data quality year on year.

Measure	East Anglia	LNE	Scotland	Southern
Ops performance: time recording	B2	C2	B2	B2
Ops performance: attribution to delay code	B3	B3	B3	B3
Ops performance: internal audit of attribution	C2	C3	B2	B2
Broken rails (M1)	B1	B1	B1	B1
Defective rails (M2)	C3	B4	B4	B2
Temporary speed restrictions (M4)	B2	B3	B2	B2
Bridge condition index (M8)	B3	B4	B4	B3
Signalling failures (M9)	B4	B4	B4	B4
Signalling asset condition (M10)	C4	B4	C4	B4
AC traction power incidents causing delay (M11)	B3	B3	B3	BX
DC traction power incidents causing delay (M12)	B3	B3	BX	B3
AC electrification condition: feeders/ TSP (M13)	B3	B3	B3	BX
DC electrification condition (M14)	B3	B3	BX	B3
AC traction contact system condition (M15)	C3	C3	C3	CX
DC traction contact system condition (M16)	C3	C3	CX	C3
Station condition index (M17)	B2	B2	B2	B2
Station facility score (M18)	B2	B2	B2	B2
Activity volumes: track (M20, M21, M22, M25)	B2	B2	A2	B2
Activity volumes: signalling (M24)	C2	A1	C2	C2
Activity volumes: structures (M23, M26-M29)	C2	B2	B2	B2
Network capability (C1-C4)	B2	B2	B2	B2
Reconciliation for Business Plan 2003/04	A2	B3	A2	B3
Customer reasonable requirements	A2	A2	A2	A2

HQ championed measures	
Track geometry (M3)	A2
Level 2 exceedences (M5)	A2

Figure 4.4.1 Confidence grades for the results in Annual Return 2003/04

- 4.3.5 While Reporters A and B have used the same confidence grading criteria as set out in the OFWAT system, the grades arrived at are dependent on the specific analysis, level of audit and investigation carried out and therefore differing grades between the two Reporters may be partially due to these differences rather than fully attributable to variances between Network Rail Regions.

5 Audit report and commentary

5.1 Operational performance

Scope of audit

5.1.1 Audits of the Annual Return 2003/04 data for this measure were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions.

5.1.2 This measure records the number of delay minutes caused by Network Rail on its infrastructure. The Annual Return provides a breakdown of delay minutes by Region, cause and by the train operator affected.

Annual Return 2003/04 results

Regulatory target

5.1.3 Network Rail's target for 2003/04 was 13.25 million delay minutes. Actual delay minutes for the year were 13.7 million, 3% higher than the target.

National results

5.1.4 Figure 5.1.1 shows delay minutes have decreased by nearly 7% from 14.7 million in 2002/03. This equates to a fall of 8.7% when normalised to reflect traffic growth over the year. The biggest reductions in delay minutes are in categories for 'Severe weather/structures' (29% reduction) and 'Track defects & TSRs' (15% reduction).

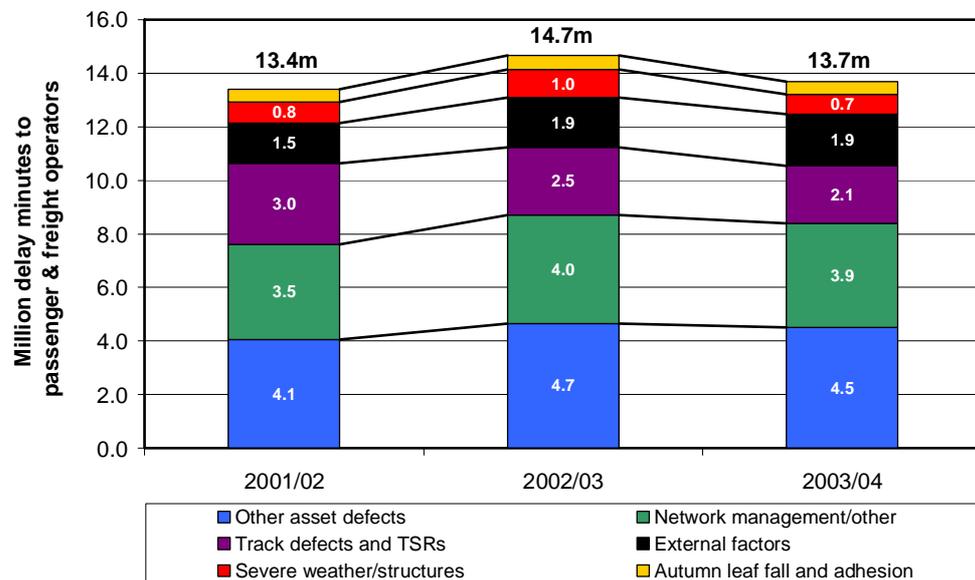


Figure 5.1.1 Delay minutes disaggregated by delay category

5.1.5 We have focussed our analysis on two delay categories of interest:

- Delay category 104B (broken rails and track faults); delays in this category have increased as the number of broken rails and track defects have reduced
- Delay category 106 (other infrastructure delay), as the results for this category vary significantly between Regions.

Delay category 104B: broken rails & track faults

5.1.6 Delays relating to broken rails and track faults are attributed to category 104B. Figure 5.1.2 shows a steady increase in delay minutes for this category over the past three years despite a marked improvement in the number of broken rails reported.

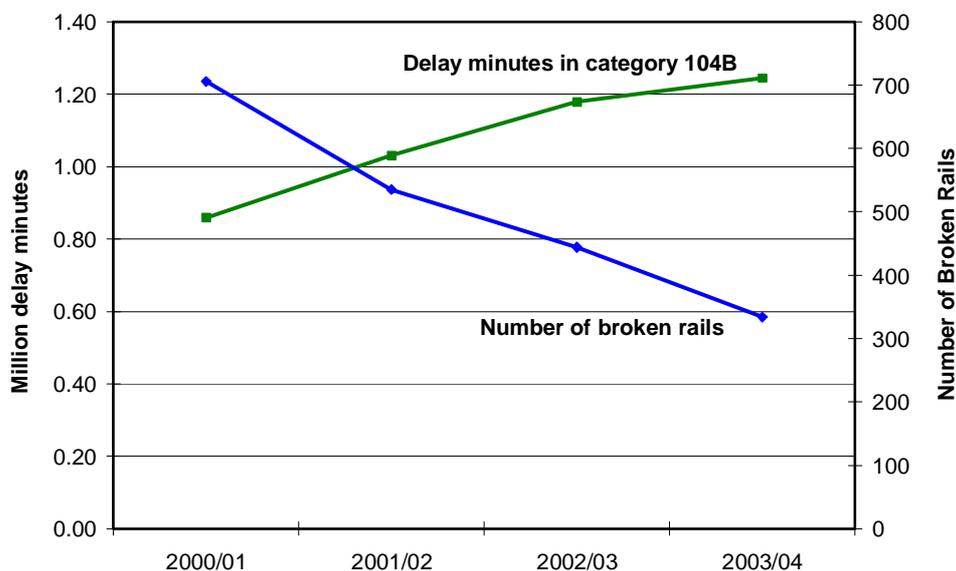


Figure 5.1.2 Number of broken rails and delay minutes in delay category 104B

5.1.7 The number of rail defects recorded in this year's Annual Return has also fallen; this has not been reflected in the delay minutes either.

5.1.8 We believe that this trend is caused by:

- (a) Track faults which do not involve broken rails; we have presented further analysis of this in Appendix C
- (b) An increase in 'engineering-led' decisions to impose early speed restrictions on tracks with defects; speed restrictions have the potential to both reduce the number of broken rails and increase delay minutes
- (c) An increase in track faults over the hot summer months of 2003 when little track maintenance could be undertaken due to the risk of track buckling
- (d) Attribution problems in East Anglia Region between delay codes 104A and 104B – though the extent of this problem has subsequently been reduced.

5.1.9 During our analysis of delay category 104B, we found evidence of misreported delays. We identified 262 incidents containing reference to broken rails in the TRUST free text field:

- (a) 226 of these were correctly allocated to delay code IR (broken/ cracked/ twisted/ buckled/ flawed rail)
- (b) 34 of these were attributed to delay code IS (track defects other than rail defects such as broken fish plates and wet beds)
- (c) Two were allocated to delay code IT (bumps reported – cause not known).

5.1.10 We were surprised that such a high percentage of incidents containing reference to broken rails in the TRUST free text field were not coded to IR. If all of these incidents are instances of mis-reporting then 13% of delays (or 10% of delay minutes) associated with broken rails have been allocated to the wrong delay code. A similar picture was evident in previous years, suggesting this is not an issue that is isolated to 2003/04.

Delay category 106: 'Other Infrastructure'

5.1.11 Figure 5.1.3 shows an increase of 30% in delay minutes for delay category 106 (other infrastructure delay) over the last two years.

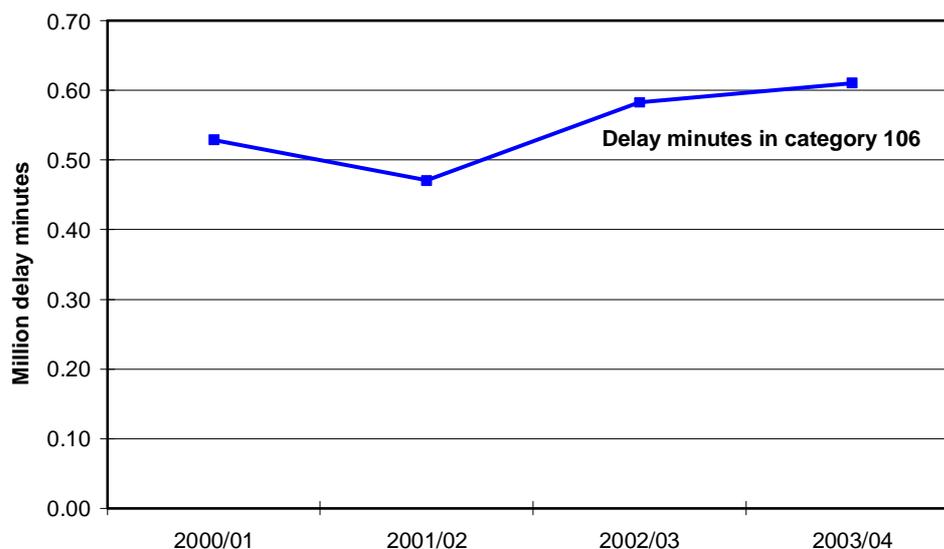


Figure 5.1.3 Delay minutes in delay category 106 (other infrastructure delay)

5.1.12 Figure 5.1.4 shows there is significant variation in the percentage of delay minutes attributed to this delay category between the Regions.

Region	Category 106 (million delay mins)	Total delay (million delay mins)	Category 106 as % of total delay
East Anglia	0.03	1.25	2.2%
Great Western	0.05	1.74	2.6%
LNE	0.09	2.40	3.7%
Midland	0.28	2.70	10.5%
North West	0.07	1.87	3.9%
Scotland	0.01	0.83	1.3%
Southern	0.08	2.89	2.8%

Figure 5.1.4 Delay minutes in delay category 106

5.1.13 Midland Region has by far the highest percentage of unexplained infrastructure delays (10.5%); indeed, delay category 106 has the highest number of delay minutes of all delay categories for this Region. There is also a significant range in the percentage of delay minutes in delay category 106 for the Regions we audit, ranging from 1.3% (Scotland) to 3.7% (LNE); this is a variance of 185%. This is likely to reflect a difference in attribution practices between Regions.

5.1.14 Figure 5.1.5 shows an analysis of the number of delay incidents and number of delay minutes for each delay code in delay category 106 between 20001/02 and 2003/04.

Delay Code	Incidents			Thousand delay min		
	01/02	02/03	03/04	01/02	02/03	03/04
IO – Network RailIN & CSR/DOO failures	390	188	200	11.0	6.9	9.3
IZ – Other infrastructure causes	4,769	6,220	7,264	430.0	510.8	521.2
JL – IMC/TRC staff error	529	517	613	53.9	41.5	69.3
JX – Miscellaneous items on line ¹	102	102	141	11.0	30.1	11.4
JZ – Not defined	1	0	6	0.0	0.0	1.2
Total	5,791	7,027	8,224	505.8	589.4	612.4

Figure 5.1.5 Delay minutes in delay category 106

- 5.1.15 Code IZ ('other infrastructure causes') forms a large majority of the incidents and delay minutes. We examined all delays in Code IZ for period 13 2003/04 and found a number of faults apparently caused by rolling stock or signalling; these did not appear to have been attributed in line with the Delay Attribution Guide.
- 5.1.16 Whilst we did not seek to quantify the extent to which delays are misallocated to delay category 106, it is clear from the significant variations between Regions, and our review of the data, that delays are not consistently allocated to category 106 across the network.

Findings

Process

- 5.1.17 There are no separate regulatory procedures or definitions for this measure. Delay data is collected in accordance with the Delay Attribution Guide (DAG) dated September 2002.
- 5.1.18 There has been no change to the DAG since last year's audit; however, its ownership has changed from Network Rail to the Delay Attribution Board during the year.

East Anglia Region

- 5.1.19 Delay minutes fell by 3% in 2003/04 against a target of 9% reduction.
- 5.1.20 The main causes for missing the target were the hot weather last summer and a number of severe lineside fires. The weather caused clay shrinkage resulting in destabilisation of the track bed and also affected overhead line equipment, particularly at under-bridges or where there are no adjustment weights for tensioning. Subsequently, rail stressing and OLE tensioning have been undertaken to mitigate these failures.
- 5.1.21 A 'weather strategy specialist' has been appointed in each Region with responsibility for managing precautionary measures in advance of extreme weather conditions; we should expect these appointments to reduce weather-related delay in next year's Annual Return.
- 5.1.22 Unexplained delays in East Anglia are less than in other Regions (1.1% of total delays compared with a national average of 3%). We believe this is due to the relatively high number of delay attributors in the Region, proactive data quality management in the Region and good communication between Network Rail and train operators in the Liverpool control room, where operational controllers are co-located.
- 5.1.23 Train planning delays were higher for a majority of periods in 2003/04 compared with 2002/03. This is an ongoing problem, especially when re-timetabling services for possessions and blockades; we should expect improvements once a national reorganisation of the operational planning teams is complete later this year.

London North Eastern Region

- 5.1.24 LNE reported a 9% decrease in delay minutes for 2003/04 compared with a targeted 16% decrease.

¹ Delay code JX excludes delay from trespass, vandalism, weather and objects fallen/thrown from trains.

- 5.1.25 Similar to East Anglia, incomplete rail stressing records reduced the Region's ability to target high risk sections of track during hot weather in the summer months; this led to a high number of heat-related TSRs (temporary speed restrictions).
- 5.1.26 The Region discontinued their Quality of Incident Creation audit system half way through last year due to resource constraints. This has not been re-instigated.
- 5.1.27 A TRUST outage in March impacted the reported data for the 2003/04 year. A cable fire in Manchester affected TRUST for York, Sheffield, Newcastle, Peterborough and Kings Cross areas. Systems were restored in 24 hours using indirect back up links except for the Sheffield area, where systems were not fully restored for 4 days due to a fault on the back up link.
- 5.1.28 In the areas that were restored within 24 hours, train timings were manually entered into TRUST based on station timings provided by the train operators. Interpolation of timings was undertaken where necessary. The outage in the Sheffield area required extensive interpolation of timings between stations; for example, timings were made at Doncaster and Sheffield but not in between. Where times could not be interpolated, delays were attributed to a separate delay code (OP).
- 5.1.29 A total of 1,951 delay minutes were attributed to this incident (some of which were also incurred in period 1 of 2004/05). This represents 0.1% of the Region's total delay minutes for 2003/04.
- 5.1.30 We understand that improved network-wide disaster recovery procedures for TRUST are planned to ensure system recovery within 4 hours on a network-wide basis.

Scotland Region

- 5.1.31 Delay minutes fell by a third in 2003/04 to 0.83 million minutes beating the target.
- 5.1.32 Much improved performance is due to few severe weather events last year in Scotland and improved management of maintenance activities.
- 5.1.33 There has been significant growth in freight traffic over the year in the Region, particularly from Hunterston to Longannet and Drax power station. This increase in freight traffic has not impacted delay this year but increases the risk of reactionary delay following an incident; this may impact next year.
- 5.1.34 Scotland Region is currently undertaking a series of timetabling initiatives which we should expect to lead to reduced delays next year. This work includes optimisation of the working timetable (WTT) at junctions using the modelling tool Merit and validation of sectional running times for the Fife Circle with ScotRail.

Southern Region

- 5.1.35 Delay minutes were 6% lower than last year, but the internal target was not met.
- 5.1.36 Performance in the year was adversely affected by delays caused by hot weather and two large incidents: a power supply failure which affected much of south east London and a crane toppling on to the tracks at Clapham Junction during a possession.
- 5.1.37 Unexplained delays were reduced by almost 40%; the Region attributed this to the implementation of a new training package for delay attributors.
- 5.1.38 As part of Network Rail's policy to in-source its contracted-out maintenance activities, the Wessex area became directly managed mid-way through the year. Regional personnel reported a stronger focus on operational performance and improved engagement amongst maintenance personnel.
- 5.1.39 Network Rail and South West Trains controllers are now co-located under a unified management structure in the Wessex Integrated Control Centre (ICC) at Waterloo. We observed evident motivation to optimise service delivery to passengers. Controllers reported improved management of incidents due to the availability of decision makers and a non-partisan approach which led to more openness and trust between participants. We should expect improved performance, which we will review in next year's audits.

Confidence grade

- 5.1.40 Network Rail has not assigned a confidence grade for this measure in the Annual Return 2003/04. Similar to last year, we have provided confidence grades for three elements of the delay attribution process: time recording, attribution to delay code and internal audit of attribution by the Region.
- 5.1.41 The grades we have awarded this year are summarised in Figure 5.1.6 and described in the paragraphs that follow.

Process	East Anglia	LNE	Scotland	Southern
Time recording	B2	C2	B2	B2
Attribution to delay code	B3	B3	B3	B3
Internal audit of attribution	C2	C3	B2	B2

Figure 5.1.6 Confidence grades for Operations Performance

Time recording

- 5.1.42 The time recording process is largely automated using train describers, the SMART concentrator system and TRUST database; systems faults lead to manual reporting or extrapolation of data. Where manual recording of train timings is undertaken, it is in accordance with a process. This merits a reliability grade of B. The TRUST outage on LNE Region led to significant extrapolation for a very small percentage of its data; however, we believe this merits a C reliability grade.
- 5.1.43 Where the process is largely automated we believe the accuracy of the timing data is within $\pm 5\%$; this error rate is driven largely by system faults such as train describer failure. We estimate manual reporting of train timings has an error rate of $\pm 10\%$. LNE suffered a short TRUST outage in the year but, as this affected less than 1% of its total measurements in the year, this is unlikely to have had a significant impact on the accuracy of the year's total delay minutes.

Attribution to Delay Code

- 5.1.44 The attribution of delay is undertaken in accordance with the DAG. However, this document does not describe a complete definition and procedure for this measure. The attribution of delay is often based on detective work by attributors and sometimes on limited information and unconfirmed reports.
- 5.1.45 As a partial definition, the DAG is subject to interpretation and – as suggested by our analysis of Delay Category 106 – has led to differences in attribution practice between Regions. This impacts reliability and accuracy. We believe the attribution process has a reliability of B.
- 5.1.46 The total amount of unexplained delay is 3% nationally. For measure M9 (signalling failures) we were provided with information on an LNE delay attribution which showed a 9% misallocation of delay minutes (see section 5.6). We therefore believe the accuracy of attribution is no better than $\pm 10\%$ for all Regions.

Internal audit of attribution

- 5.1.47 We have slightly increased the confidence grade from last year for East Anglia Region to reflect the good, and improving, relationship between Network Rail and the TOCs in delay investigation. Scotland Region have also taken some steps to improve the audit of delay attribution and we have therefore marked this area at a slightly higher grade than last year.
- 5.1.48 The opening of the Wessex ICC in Southern Region has benefited the attribution of delay and the Region also utilises a number of exception reports to assist in the validation of attribution. This is reflected in a slightly higher grade than in last year's audit report.

- 5.1.49 LNE Region has discontinued their Quality of Incident Creation system due to resource constraints which has had a negative impact on the quality of incident creation and this is reflected in a slightly lower grade than last year.

Recommendations & observations

- 5.1.50 We believe a target of B2 should be achievable for this measure. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
- 5.1.51 We recommend Network Rail develop a robust standardised training programme for delay attribution, seeking to build on existing best practices in delay attribution and current training materials from headquarters and the Regions. All personnel undertaking attribution should be trained using this programme. This would much enhance reliability and accuracy of delay attribution.
- 5.1.52 We recommend Network Rail develop and document a single approach to the validation and audit of attribution. This would enhance the reliability and accuracy of delay attribution.
- 5.1.53 We recommend the results of Scotland Region's analysis of the Fife Circle WTT point-to-point timings and their implications for the present components of Rules of the Plan are reviewed. We believe that there will be transferable lessons from this work, particularly for the WTT planning process.

5.2 Broken and defective rails (M1 & M2)

Scope of audit

- 5.2.1 The audit was undertaken to assess the accuracy and confidence in the Broken Rails (M1) and Defective Rails (M2) data presented in Network Rail's 2003/04 Annual Return to the Office of Rail Regulation (ORR).
- 5.2.2 M1 is a measure of broken rails. M2 is a measure of continuous and isolated defects in rails, reported as the total length of continuous defects and the total number of isolated defects that are detected, removed, repaired (through weld repairs or grinding), and remaining at year-end. These are both measures of asset stewardship.

Annual Return 2003/04 results

Regulatory target

- 5.2.3 The regulatory target for the number of broken rails (M1) is 675 for 2003/04, down from a previous target of 705 in 2002/03. The regulatory target was met for this measure.
- 5.2.4 There is no regulatory target for rail defects (M2).

Results

Rail breaks (M1)

- 5.2.5 334 broken rails were reported for 2003/04, bettering the regulatory target by over 50%.
- 5.2.6 Figure 5.2.1 shows the number of rail breaks reported this year is continuing the downward trend of this measure since the year 2000.

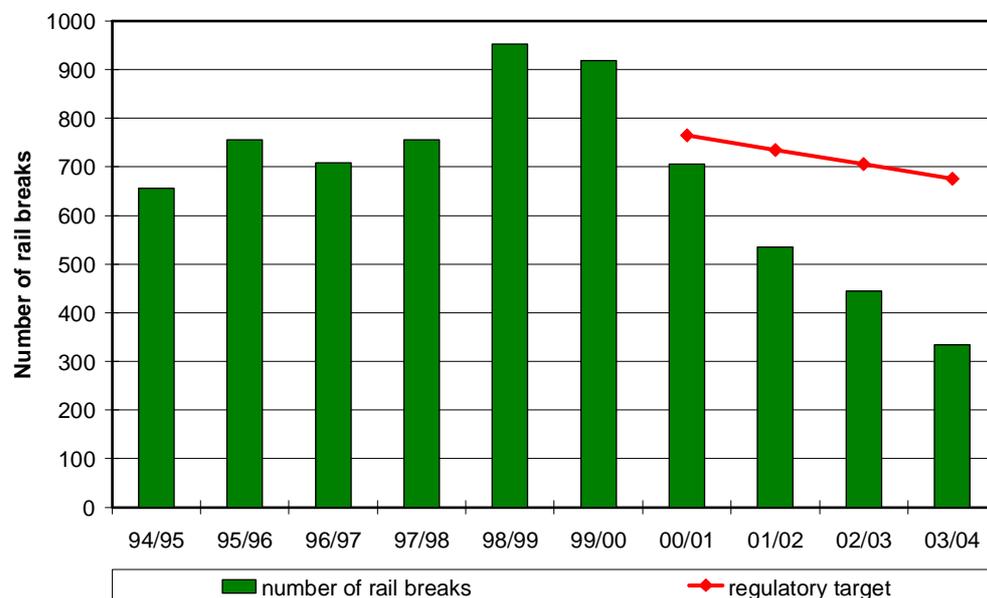


Figure 5.2.1 Broken rails

- 5.2.7 The key factors involved in delivering this reduction in rail breaks are:
- Improvement in rail break management processes
 - Increased re-railing and renewals volumes
 - Introduction of rail grinding programmes using a fleet of rail grinding trains
 - Introduction of improved non-destructive testing technologies

5.2.8 Figure 5.2.2 shows track renewals expenditure has increased more than threefold since 1998/99 to £1.2 billion and the year-on-year rail break improvement over the same period averages 18%.

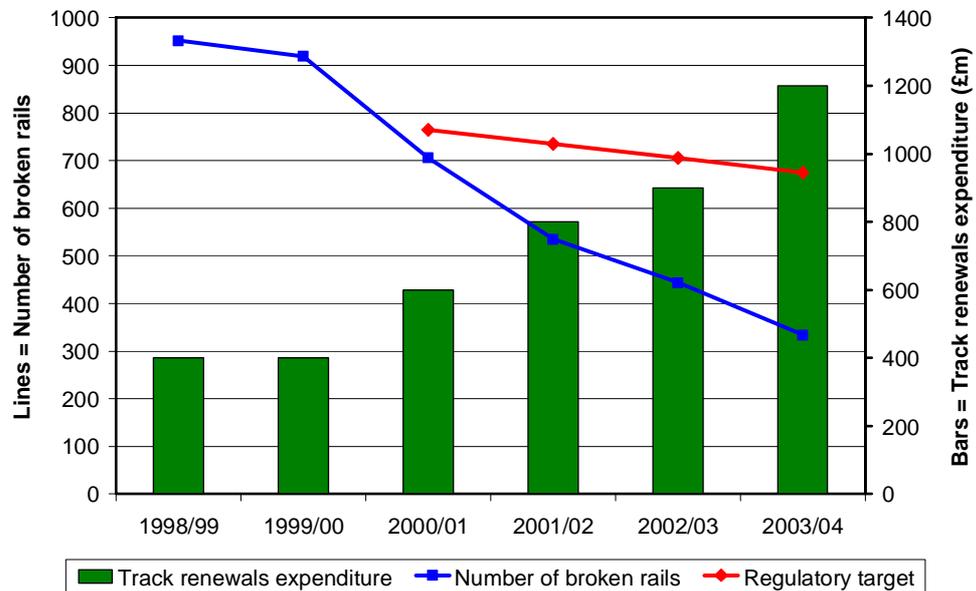


Figure 5.2.2 Broken rail performance and track renewals expenditure

Track defects (M2)

- 5.2.9 Following our recommendations last year, we note Network Rail is seeking to improve its data management for rail defects. The results of the data correction exercise has improved our confidence in the 2002/03 data which has effectively been restated in this year's Annual Return; however, our confidence in the reported data for 2001/02 has now significantly reduced as it has not been corrected.
- 5.2.10 The M2 measure for the number of isolated rail defects for 2002/03 has effectively been restated as 27,892 defects. The number of isolated defects reported for 2003/04 is 31,301. This represents a 12% year-on-year increase. Figure 5.2.3 shows a comparison of the Regions we audit. Scotland Region has reported a significant number of defects this year; however, our Regional audits have identified inconsistencies in the reporting of rail defects leading us to believe that Scotland Region is over-reporting the isolated rail defects figure (see paragraph 5.2.28).
- 5.2.11 The M2 measure for continuous rail defects for 2002/03 has effectively been restated as 1,986km due to a data correction exercise. Continuous rail defects remaining at the end of 2003/04 have therefore decreased by 6% to 1867km. This reflects the level of rail renewals and associated expenditure levels incurred over the last five years to combat continuous rail defects.

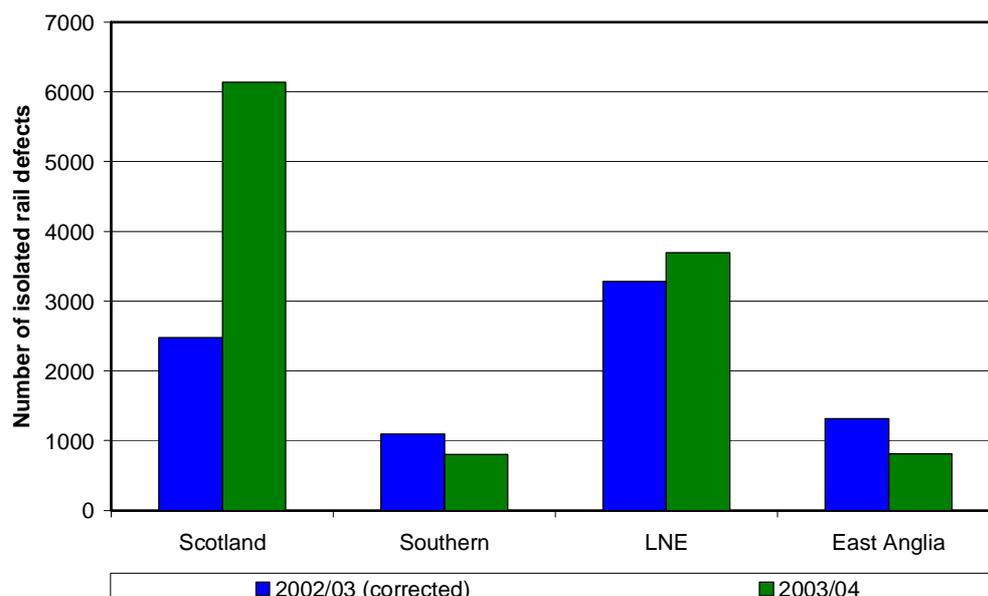


Figure 5.2.3 Isolated rail defects

Findings

Asset Reporting Manual

- 5.2.12 The ARM definitions and procedures are unchanged since last year. The Rail Failure Handbook (RT/CE/S/057) and the Instruction on the Management of Rails to Control RCF (PWSI 4) have been re-issued to clarify the reporting, classification and inspection processes for rail defects.
- 5.2.13 We found the Regions were compliant with the ARM definitions and procedures but identified variations in interpretation of the supplementary standards for track defects, as described in the sections below.

East Anglia Region

Rail breaks (M1)

- 5.2.14 East Anglia Region reported 29 broken rails for measure M1, bettering an internal target of 31. We found that rail break data was efficiently managed and a suitable audit trail was identified; the Region complied with the procedure and definition for the M1 measure and no material discrepancies were identified in the reported results.

Rail defects (M2)

- 5.2.15 The number of isolated rail defects remaining in track at year end is 814, representing a 38% decrease on the corrected 2002/03 year end figure of 1313.
- 5.2.16 During an investigation of the Region's defect reporting database, we found that data corrections were applied throughout the year. 4,120 defects were removed from the system during the year; however, Regional personnel could not confirm whether changes were due to physical corrective action on the track or alteration of previously incorrect data. Regional personnel acknowledged that this indicated an inefficient process, which might also lead to inaccurate reporting of defects. This problem was found to exist in all Regions.
- 5.2.17 The Region and one of its infrastructure maintenance contractors formally changed the management information system for rail defect data from MORFI to RADAR in the second quarter of 2003/04 as MORFI was not fully compliant with the relevant Network Rail standard. We found that MORFI was still used by maintenance personnel for continuous defect reporting and RADAR was used for isolated defect reporting.

- 5.2.18 We could not establish a robust audit trail for the number or length of defects as:
- (a) We found an inconsistent reporting process at the maintenance depots
 - (b) The initial report of a defect does not use a standard format – some reports are made by email, others by paper
 - (c) Hard copies of the periodic defect reports prepared by maintenance personnel were missing.

London North Eastern Region

Rail breaks (M1)

- 5.2.19 The Region reported 53 broken rails this year, down from 79 last year, bettering its internal target by 36%. We found that the Region had undertaken additional ultrasonic testing, exceeding the requirements of Network Rail's standard, which may have led to improved rail management and reduced rail breaks.
- 5.2.20 We found the rail break and defect reporting process was more protracted than the processes observed in other Regions: it required a greater degree of effort to manipulate, check, interrogate and report results. The Region complied with the procedure and definition for the measure. We reviewed the rail break data and found no material discrepancies were identified in the results reported.

Rail defects (M2)

- 5.2.21 The Region reports a 13% increase in rail defects compared to last year's corrected figure. The 2002/03 reported figure had previously been over-reported by approximately 46%.
- 5.2.22 We found that the isolated rail defect numbers were subject to significant data corrections during the reporting year, to compensate for the time lags commonly found in the defect reporting process. We have concerns regarding the size and frequency at which these data corrections were applied and their impact on the accuracy of the reported results. We were unable to identify an audit trail or a definitive number of isolated defects for the Region to compare with the Annual Return.
- 5.2.23 A significant proportion of continuous rail defects are RCF defects (rolling contact fatigue defects), which are classified as either 'light', 'moderate', 'heavy' or 'severe'. We found that LNE had misinterpreted the reporting requirements and did not report any RCF defects during periods 1-7 this year. Between periods 7-12, LNE did not report RCF defects classified as 'light'. The rail defect periodic returns to ORR from LNE are therefore incomplete for 2003/04.
- 5.2.24 We found the continuous defect results reported for the M2 measure this year did not include RCF defects classified as 'light'. A sense check of the Regional records discovered that the continuous rail defect figure reported in the Annual Return may under-report by up to 20%. This is a material discrepancy in the reporting of this measure.

Scotland Region

Rail breaks (M1)

- 5.2.25 Scotland Region reported 35 broken rails this year compared with 40 last year. We believe re-railing and rail grinding works have been the main drivers for reducing rail breaks on this Region.
- 5.2.26 We assessed the Region's rail break information and were able to develop a suitable audit trail. Although not every rail break was supported by all of the documentation we requested, evidence was presented confirming the number of breaks reported. The Region complied with the procedure and definition for the M1 measure and no material discrepancies were identified in the reported results.

Isolated rail defects (M2)

- 5.2.27 We were informed that the isolated rail defect results for the 2002/03 year have previously been under-reported by 51% because of missing or wrongly allocated defect records.
- 5.2.28 The corrected number of isolated rail defects between 2002/03 and 2003/04 has increased by 146%. However, these figures include some 5,300 minor visual defects such as blemishes and surface markings. We believe this is a misinterpretation of Network Rail standard RT/CE/S/057 Issue 4. These 5,300 visual defects should not be reported as part of measure M2 as they do not require further action and therefore do not fall within the definition of a reportable defect. This is a material discrepancy in the reporting of this measure.

Continuous rail defects (M2)

- 5.2.29 We found that the Region's interpretation of Network Rail standard RT/CE/S/057 Issue 4 has also led the Region to overstate the length and number of continuous defects reported for M2 this year. The standard requires that sites which are re-railed due to RCF defects should be input to the reporting database and classified as 'light' RCF even though the rails have been replaced; this prompts the maintainers to inspect the site for RCF on the new rails.
- 5.2.30 As these sites are in the reporting database for administrative ease and are not sites with defects, these sites should not be reported for the M2 measure. Unfortunately, these 're-railed ex-RCF sites' have been included in the results for this year. The Region reports a total of 704,457 yards of continuous rail defects at year-end. Our analysis of the Regional data sources reveals that 23% of this total relates to ex-RCF sites. This is a material discrepancy in the reporting of this measure.

Southern Region

Rail breaks (M1)

- 5.2.31 The Region reported a 30% decrease in the number of broken rails compared to last year. The actual figure reported, 63, is less than the Region's internal target of 66.
- 5.2.32 In 2002/03, Southern was the only Region to report an increase in broken rails, primarily during cold weather periods. Seasonal affects were less significant during 2003/04; we suggest that the extensive rail grinding and re-railing programmes on the Region were the primary drivers behind the reduction in broken rails this year.
- 5.2.33 The Region complied with the procedure and definition for the M1 measure and an audit trail was developed for the reported results.

Rail defects (M2)

- 5.2.34 The Region reported a 27% reduction in the number of isolated rail defects remaining in track (after data correction). The Region has significantly improved the rail defect reporting process, primarily as a result of the introduction of a new defect reporting system, RADAR, in one of its maintenance areas. We reviewed the system and associated processes and checked the system records against the reported figures. No material discrepancies were found.
- 5.2.35 The Region has reduced the length of continuous rail defects remaining in track by 13% from 2002/03 levels. RADAR is also used to report continuous rail defects except RCF, which are reported separately by each maintenance area. We investigated this method of separately reporting RCF and found it to be well managed. The continuous rail defect figure reported by the Region was judged to be reliable based on the supporting information provided.
- 5.2.36 We were interested to note that the Region reported problems with 'false positives' using the UTU2 ultrasonic defect detection trains. The train-based system was reported to be identifying a significant number of defects which could not be validated using subsequent hand-held ultrasonic equipment. A similar issue was found in other Regions.

Confidence grade

- 5.2.37 We found the broken rail data was well managed, with Regional personnel in a position to account for each broken rail reported. In some cases not all the required information on broken rails, such as broken rail incident forms or investigative reports, could be presented. However due to the supplementary reporting processes in place, this did not affect the accuracy of the figures. We believe this merits a confidence grade of B1 to the broken rails measure for each Region.
- 5.2.38 The reporting of the rail defect figures during the 2003/04 reporting year has suffered from an inconsistency in the application of standards between Regions. The quality of reporting processes observed were found to be in need of much improvement.
- 5.2.39 We believe the following confidence grades are merited for each of the Regions:
- (a) East Anglia Region: C3
 - (b) London North Eastern Region: B4
 - (c) Scotland Region: B4
 - (d) Southern Region: B2

Observations

- 5.2.40 We have found a significant number of in-year and year-on-year data corrections for the rail defect measures and inconsistencies in the definition of the rail defects reported. We believe that one Region has over-reported this year (Scotland) and other Regional data cannot be fully validated (LNE and East Anglia). The extent of these errors is likely to have masked any underlying changes in rail defect rates or the condition of the rails. We suggest a target of B2 should be achievable in all Regions.
- 5.2.41 The Regions are united in reporting a lack of guidance from HQ in the application of standards. Regional interpretations of the standards have led to an inconsistency in the data reported. This was evidenced by:
- (a) Scotland Region reporting all non-actionable defects and re-railed RCF sites as live defects;
 - (b) London North Eastern Region failing to report "light" RCF defects throughout the reporting period and in the Annual Return;
 - (c) Southern Region reporting only actionable isolated defects and only live continuous RCF defects.
- 5.2.42 Some Regional processes were found to be disparate, requiring tighter control and management. East Anglia was unable to fully account for its reported defect numbers and had lost periodic defect data from its maintainers. London North Eastern struggled to present supporting evidence to confirm its reported figures in the Annual Return.
- 5.2.43 The quality of the data presented by the Regions in the Annual Return 2003/04 is open to criticism. Furthermore this data has been uploaded into Network Rail's Raildata database which is used to drive renewals volumes as part of the company's business planning processes.

Recommendations

- 5.2.44 We believe a target of B2 should be achievable for this measure. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
- 5.2.45 We recommend that Network Rail should issue a clear instruction to ensure RCF sites which have been re-railed should not be included in the continuous defect numbers if no cracking is present in the rails. This may require updates to Regional reporting databases but will provide a more accurate representation of the condition of the network.
- 5.2.46 We recommend the M2 measure is reviewed by Network Rail and ORR to investigate the usefulness of separately tracking 'sites with RCF' and the 'sites prone to RCF where no defects are currently present'.

- 5.2.47 Our auditors have been unable to establish robust audit trails for the M2 measure due to the extent of 'data refreshes'. We recommend that the procedure for the measure should require Network Rail reporting champions to provide a commentary explaining the reasons for these interventions, such that an audit trail is retained to support the reported data.
- 5.2.48 We remain concerned as to the extent of 'data refreshes' for the M2 measure. We recommend that Network Rail review the process of collecting and reporting the M2 measure to identify the causes of these interventions and take steps to eliminate these causes where practicable.
- 5.2.49 We recommend that the defect data in Raildata is subject to review and is refreshed as appropriate.
- 5.2.50 The Regions reported problems with 'false positives' using the UTU2 ultrasonic defect detection trains. The train-based system was reported to be identifying a significant number of defects which could not be validated using subsequent hand-held ultrasonic equipment. The situation requires investigation by Network Rail to ensure the outputs from these trains are reliable and can be efficiently validated fully using the inspection techniques available.

5.3 Track geometry (M3 & M5)

Scope of audit

5.3.1 The audit was undertaken to assess the accuracy of and confidence in the national Track Geometry data reported in the Annual Return 2003/04 to the ORR, which is presented in terms of the following measures:

- (a) National standard deviation (SD) data (M3)
- (b) Poor track geometry (M3)
- (c) Speed band data (M3)
- (d) Level 2 exceedences (M5)

5.3.2 The audit was undertaken at Network Rail HQ only, where track geometry data for all four measures is collated, analysed and reported. The audit did not involve a detailed assessment of outputs from the track recording vehicles, calibration of the track recording vehicles or on-site investigations into the data validation processes.

Annual Return 2003/04 results

Regulatory target

5.3.3 For national standard deviation (SD) data, the targets are to reduce as reasonably practicable the amount of track not yet achieving the 100% standard, as quantified by the target percentages stated in Figure 5.3.1 below:

Standards	35m Top (Vertical Deviation)			35m Alignment (Horizontal Deviation)			70m Top (Vertical Deviation)			70m Alignment (Horizontal Deviation)		
	50%	90%	100%	50%	90%	100%	50%	90%	100%	50%	90%	100%
Regulatory target	64.6%	90.3%	98.3%	70.9%	91.6%	97.4%	62.5%	92.8%	97.8%	64.7%	91.9%	97.3%

Figure 5.3.1 Regulatory target for national standard deviation (SD) Data

5.3.4 There are no regulatory targets for the poor track geometry and speed band measures.

5.3.5 The regulatory target for Level 2 exceedences is for no deterioration from the network total reported for 2000/01, which was set at 1.820 exceedences per track mile.

Results and analysis

National standard deviation (SD) data

5.3.6 National SD data is expressed in terms of the percentage of track within the 100% ('poor' or 'better'), 90% ('satisfactory' or 'better') and 50% ('good') track quality bands for four main track quality parameters:

- (a) 35m Top: the vertical deviation of all track at 35m wavelengths
- (b) 35m Alignment: the horizontal deviation of all track at 35m wavelengths
- (c) 70m Top: the vertical alignment of track with a linespeed of 80mph or more at 70m wavelengths
- (d) 70m Alignment: the horizontal alignment of track with a linespeed of 80mph or more at 70m wavelengths.

5.3.7 The 35m and 70m filters are used to ensure that design changes in track alignment are not measured as deficiencies in track geometry.

5.3.8 The track geometry results for the 2003/04 reporting year are presented in Figure 5.3.2.

Standards	35m Top (Vertical Deviation)			35m Alignment (Horizontal Deviation)			70m Top (Vertical Deviation)			70m Alignment (Horizontal Deviation)		
	50%	90%	100%	50%	90%	100%	50%	90%	100%	50%	90%	100%
Regulatory target	64.6%	90.3%	98.3%	70.9%	91.6%	97.4%	62.5%	92.8%	97.8%	64.7%	91.9%	97.3%
Results for 2003/04	62.4%	89.2%	97.0%	72.7%	92.9%	96.5%	63.6%	92.4%	95.3%	79.5%	95.8%	97.2%
Target achieved	x	x	x	✓	✓	x	✓	x	x	✓	✓	x

Figure 5.3.2 National SD data results 2003/04

5.3.9 Five of the twelve regulatory targets were met in 2003/04; these are shaded in green. The five track quality parameters shaded in red fell short of regulatory target and exceeded the statistical tolerance for this measure. The two parameters shaded in yellow are within the statistical tolerance for the target, but nominally failed to meet the regulatory target.

5.3.10 Figure 5.3.3 shows the extent to which Network Rail has achieved, or fell short of, each of the twelve track geometry regulatory targets over the last four years:

- (a) For the first time in four years, a regulatory target in the 70m alignment (vertical deviation) track quality parameter has been met; this was for the 50% parameter.
- (b) The regulatory targets set for the 35m Top (vertical deviation) track quality parameter have not been met for the last four years
- (c) The regulatory targets set for the 50% and 90% parameters of the 35m and 70m alignment (horizontal deviation) track quality parameters have been exceeded for the last four years, although the 2003/04 figures are lower than reported in 2002/03

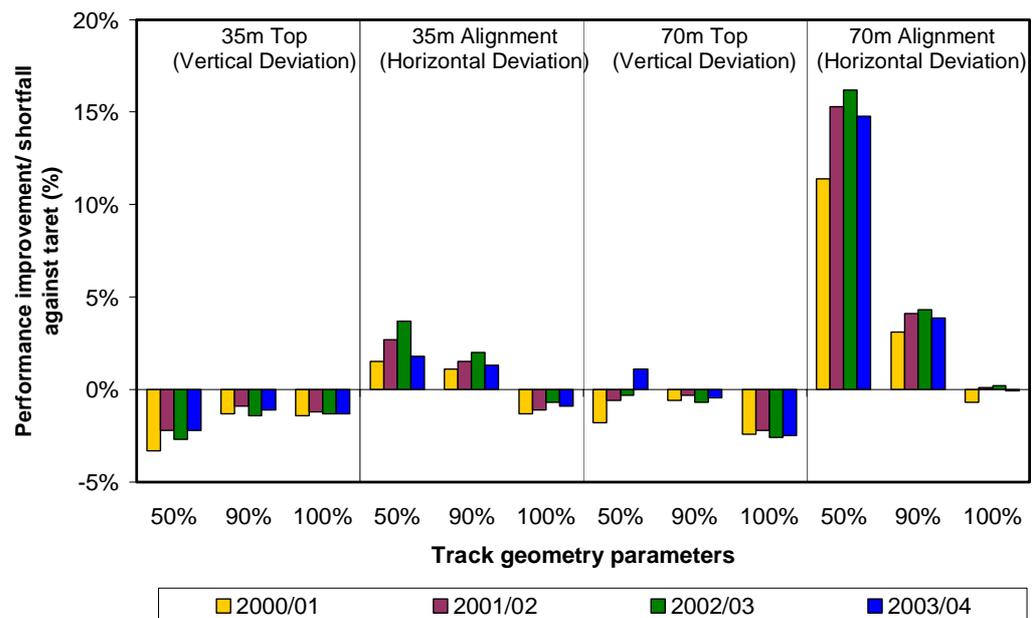


Figure 5.3.3 Percentage improvement/ shortfall against regulatory targets 2000-2004

Poor track geometry

5.3.11 For the first time, the Annual Return 2003/04 presents a measure of poor track geometry (PTG). This index is calculated using the national SD data results for each of the four track quality parameters together with the percentage of track defined as:

- (a) 'Very poor': track which fails to meet the 100% ('poor' or 'better') standard;
- (b) 'Super-red': track which exceeds the maximum standard deviation thresholds for the 35m vertical and horizontal alignments.

5.3.12 Network Rail report a PTG network score of 3.85%, which is 0.05% higher than the 2002/03 figure. A Regional comparison of poor track geometry is shown in Figure 5.3.4.

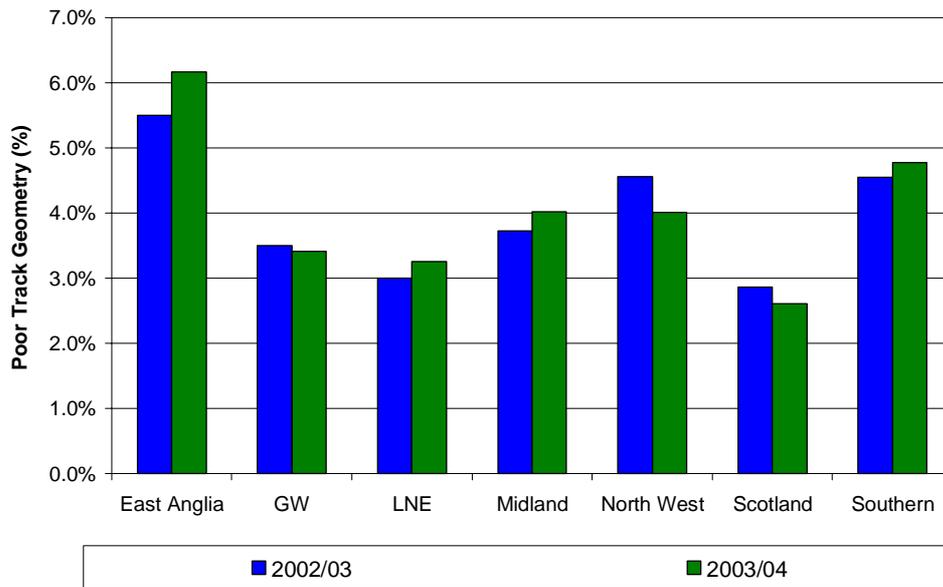


Figure 5.3.4 A comparison of Regional PTG between 2002/03 and 2003/04

5.3.13 Figure 5.3.4 shows that East Anglia Region contains a higher proportion of track classified as 'very poor' and 'super red' in comparison with the other Regions. Following discussion with the Regional Rail Management Engineer, we believe this increase in PTG has been caused by shortfalls in maintenance activities and problems with the reliability and delivery of stone blowing and tamping machines.

Speed band data

5.3.14 Network Rail report the distribution of standard deviation values by national speed bands for both the 35m and 70m top and alignment parameters. Four speed bands are listed for the 35m wavelength parameter ranging from 15 and 125 mph; we have been assured there are no running lines with a speed limit of less than 15mph. For the 70m wavelength parameter, two linespeed ranges are listed between 80 and 125 mph.

5.3.15 The speed band data presented in Annual Return Table 28 does not reconcile with the linespeed capability data presented in Annual Return Table 72. The differences lie in the total km of track figures presented within the 15-125 mph and 80-125 mph linespeed ranges, as shown in Table 5.3.5.

Linespeed Range (mph)	Total km of track in this linespeed range		Variance
	Reported in Track Geometry speed band data	Reported in Linespeed Capability data	
15 – 125	29,599	31,564	7%
80 – 125	10,380	9,409	9%

Figure 5.3.5 Variances in the reported km of track within linespeed ranges

- 5.3.16 The total km of track presented for each speed band should be identical for both the track geometry and linespeed capability measures. We found this discrepancy was due to:
- (a) The use of different data sources to report the linespeed data in the track geometry and linespeed capability measures. Track geometry linespeed data is derived using specified linespeed quality bands based on measurements taken every eighth of a mile, whereas linespeed capability data is presented on the basis of exact yardages of track taken from GEOGIS.
 - (b) The track geometry speed band data is only based on the total km of track recorded and will not include existing track which was not subject to testing by the track recording trains.
 - (c) The size of linespeed quality bands used for track geometry calculations differ from those used for linespeed capability reporting resulting in small mismatches between the attribution of the km of track within each reportable linespeed range between each measure.

Level 2 Exceedences

- 5.3.17 Level 2 exceedences are distortions in track geometry identified for short lengths of track. They apply only to the 35m wavelength measurements and are usually independent of linespeed.
- 5.3.18 Network Rail report a network total of 1.113 Level 2 exceedences per track mile for the 2003/04 reporting year, 39% below the regulatory target of 1.820. Figure 5.3.3 shows the decreasing trend for Level 2 exceedences over the last four years.

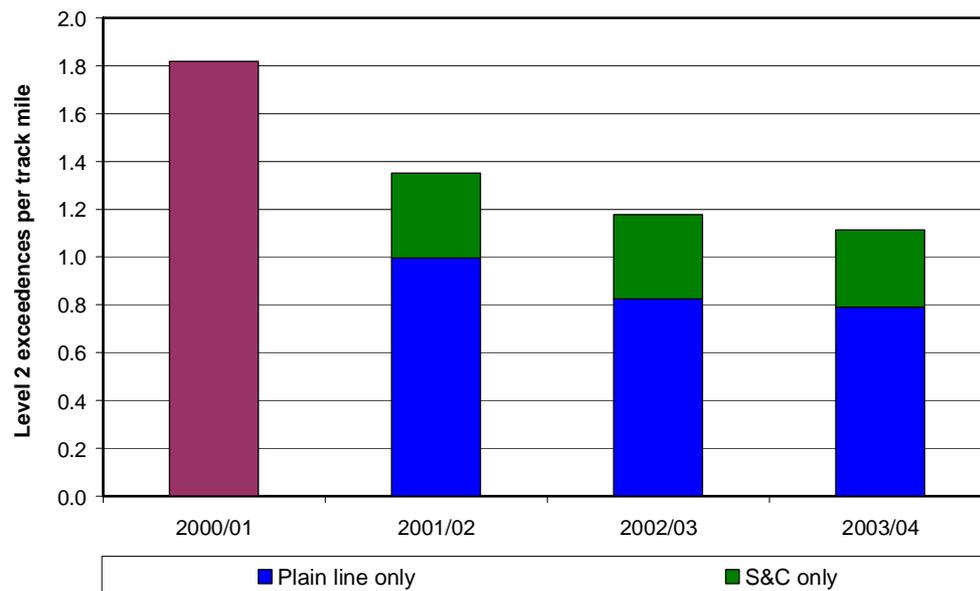


Figure 5.3.6 Level 2 exceedences

- 5.3.19 Network Rail's track quality data is analysed in units of eighths of a mile. Figure 5.3.6 shows the proportion of level 2 exceedences attributable to eighths of a mile containing plain line only and eighths of a mile containing both plain line and S&C.
- 5.3.20 Track containing plain line only has improved by a greater margin than track containing S&C. We would also note that the relatively small number of eighths containing S&C imparts a disproportionately negative affect on the network-wide total.
- 5.3.21 Figure 5.3.7 shows the Level 2 exceedences for each Region. We would note that the relative performance of Regions for Level 2 exceedences (Figure 5.3.7) is the same as the relative performance of Regions for poor track geometry (Figure 5.3.4).

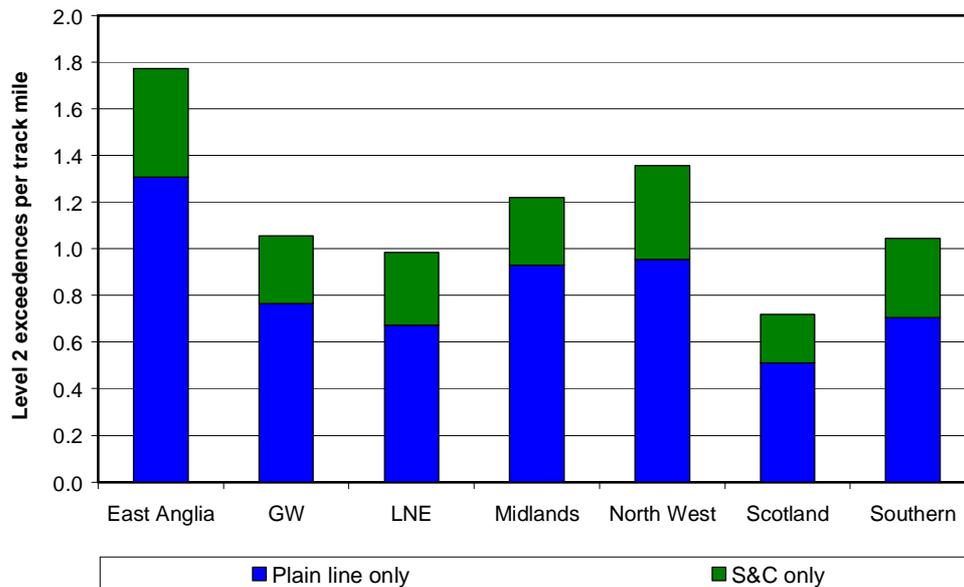


Figure 5.3.7 Level 2 exceedances for 2003/04

Findings

Asset Reporting Manual

- 5.3.22 The ARM definitions and procedures for the track geometry measures were revised in 2004 to include the definition of poor track geometry and to clarify the process for reporting track geometry data.
- 5.3.23 We found that HQ personnel complied with the procedures and definitions for the track geometry measures.

Headquarters

- 5.3.24 There have been no changes to the reporting of track geometry data from that observed during the 2002/03 audits. All track geometry data is generated by Network Rail HQ and is distributed to Regional personnel as a measurement of quality of track in each maintenance area.
- 5.3.25 The process of collating, interrogating and reporting track geometry data is manually demanding and susceptible to human error, especially in the calculation of the track geometry data. However, we have reviewed the supporting data provided by Network Rail and were able to establish an audit trail for the figures presented in the Annual Return. No errors were found.
- 5.3.26 The physical measurement of track geometry is undertaken by a contractor, operating three track recording trains which are programmed to run in accordance with the frequencies set out in the annual track measurement plan. The processes for the calibration of the track recording trains and the measurement of track quality have not changed from last year.
- 5.3.27 However, two weaknesses in the recording process remain from last year:
- Data Validation: track measurements produced by the track recording trains are not adequately validated before the data is uploaded into Network Rail databases. This would lead to the mis-reporting of track geometry results.
 - The track measurement plan was not completed again.

- 5.3.28 Network Rail and its contractor are developing ways in which data validation can be undertaken more effectively. The contractor delivered 93% of the track measurement plan for 2003/04, attributing the shortfall to the inaccessibility of certain routes and cancelled measurement runs.

Confidence grade

- 5.3.29 As noted above, this audit addressed the collation, analysis and reporting of the data, but did not involve an assessment of outputs from the track recording vehicles, calibration of the track recording vehicles or on-site investigations into the data validation processes.
- 5.3.30 These measures are well documented and follow an established procedure. The results are processed to be accurate to within $\pm 5\%$ due to possible data validation errors.
- 5.3.31 We believe this measure merits a confidence grade of A2.

Observations

- 5.3.32 The 2003/04 track geometry results indicate that Network Rail is steadily improving the quality of track on the network. We believe the improvement in Level 2 exceedences was driven primarily by re-railing and track renewals.
- 5.3.33 Although the track recording and reporting process has not changed, problems with the calibration of the measurement trains and personnel shortages identified during the 2002/03 audits were rectified during the 2003/04 reporting year. Improvements were also made to personnel training programmes.

Recommendations

- 5.3.34 Validation of data remains a possible source of error for the track geometry measures. We recommend Network Rail reviews its method of validating data from the track recording trains before it is into its databases and makes changes as appropriate.
- 5.3.35 The annual track measurement plan was not met in 2003/04. We recommend that Network Rail should investigate the frequency and causation of missed data recording runs and make change to improve delivery as appropriate.
- 5.3.36 We believe that S&C has a disproportionate effect on overall track quality data. We recommend that the M3 measures for track geometry are reported separately for plain line and S&C to provide a more transparent assessment of network stewardship.
- 5.3.37 We recommend that poor track geometry (M3) and Level 2 exceedence (M5) measures are reported separately for plain line and S&C to facilitate analysis of the different maintenance and renewals activities on track quality for each track type. This would be of particular value for assessing the impact of the new S&C maintenance and renewals programme which is being implemented by Network Rail over the next five years.
- 5.3.38 We recommend that the linespeed bands in the track geometry and capability sections of the Annual Return should be consistent. If this is not possible, the variation in the data reported between the two measures should be explained within the commentary of the Annual Return.

5.4 Condition of asset temporary speed restriction sites (M4)

Scope of audit

5.4.1 The scope of this audit was to verify the accuracy of data and commentary reported in Network Rail's Annual Return 2003/04, Section 2, Temporary Speed Restrictions (M4), including Tables 30-32. The definition and procedures for this measure are documented in RT/ARM/M4DF and RT/ARM/M4PR. Audits were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions.

5.4.2 The measure reports:

- (a) The total number of TSRs and ESRs (hereafter jointly referred to as TSRs) arising from the condition of track, structures and earthworks that are in place for 4 weeks or more
- (b) The total 'severity scores' for these TSRs based upon the length, duration and speed limit imposed compared with the prevailing line speed.

5.4.3 The measure is a proxy for the condition of the assets and the quality of Network Rail's asset stewardship. The impact of TSRs on train performance is not reflected.

Annual Return 2003/04 results

Regulatory target

5.4.4 There is no regulatory target for this measure; targeting this measure would incorrectly incentivise Network Rail to avoid imposing a TSR when a speed restriction might be justified on safety grounds.

National results

5.4.5 Nationally, there were 1,199 TSRs on the network in 2003/04 with a total severity of 6,089. Reported TSRs are dominated by track-related faults, accounting for around 90% of the total number and severity score.

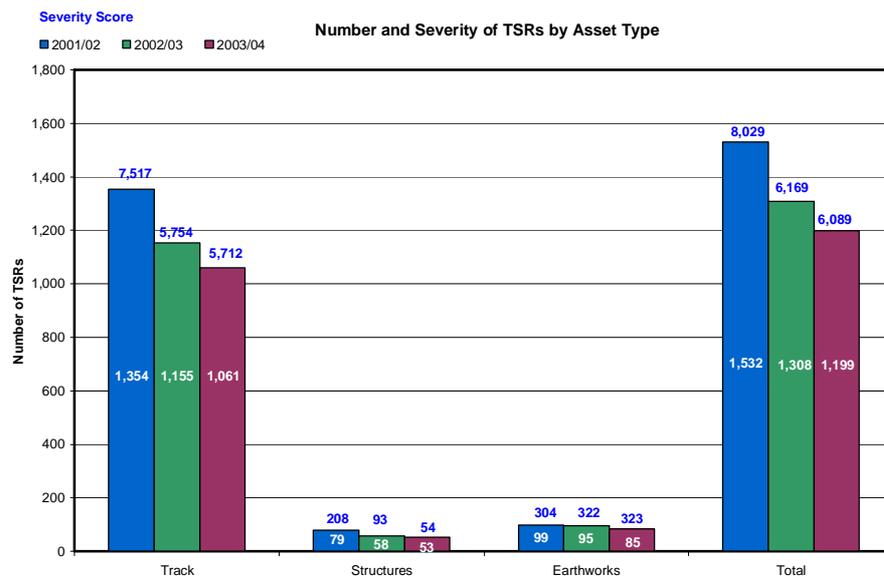


Figure 5.4.1 Number and severity of temporary speed restrictions

- 5.4.6 The year-on-year trend is shown in Figure 5.4.1². Following a sharp reduction in TSRs of 15% in 2002/03, there has been a further reduction of 8% in 2003/04. This is in contrast with the severity scores which reduced by more than 20% in 2002/03 but reduced by only 1% in 2003/04.
- 5.4.7 The Annual Return commentary suggests this improving trend is due to:
- Network Rail prioritising the removal of speed restrictions with the greatest impact on operational performance
 - A number of long term speed restrictions which have minimal impact on operations but a very high severity score.
- 5.4.8 This view is supported by the significant and sustained management focus on TSRs which we found in the Regions. Reports on the number and location of speed restrictions are circulated within each Region on a weekly basis – and in some Regions on a daily basis. In some Regions this is supplemented by the financial impact of TSRs due to performance regime payments made to train operators under track access agreements.

Regional results

- 5.4.9 Figure 5.4.2 shows year-on-year variance for the Regions we have audited. Whilst there has been a national reduction in the number of TSRs and their severity score, these measures have increased for LNE and Southern Regions whilst reducing on East Anglia and Scotland Regions.

Region	Measure	2002/03	2003/04	% Change
East Anglia	TSRs Sites	133	129	(3%)
	Severity Score	381	338	(11%)
LNE	TSRs Sites	277	296	+7%
	Severity Score	1,391	1,394	0%
Scotland	TSRs Sites	159	82	(48%)
	Severity Score	428	241	(44%)
Southern	TSRs Sites	67	86	+28%
	Severity Score	103	192	+86%
All Regions	TSRs Sites	1,308	1,199	(8%)
	Severity Score	6,169	6,089	(1%)

Figure 5.4.2 Numbers and severity of temporary speed restrictions

- 5.4.10 Of particular concern is Southern Region, where the number of TSRs has increased by nearly 30% and severity score has increased by over 80%.
- 5.4.11 Examination of the detailed data revealed more than 50% of the total severity score for Southern Region is associated with just 9 TSRs which form less than 10% of the total number. Of these TSRs, four were related to embankment shrinkage during hot weather. We found many other TSRs on the Region were also caused by shrinkage of clay soils.
- 5.4.12 Scotland Region shows a reduction of nearly 50% for number of TSRs and over 40% for severity score; East Anglia shows smaller reductions. We believe these improvements were due to an increased focus on TSRs.

Findings

Asset Reporting Manual

- 5.4.13 The definition and procedure for this measure have been heavily revised as a result of Reporters' recommendations last year and Network Rail's experience of reporting this measure over two full years. The changes have clarified some areas of uncertainty and provided more guidance to the Regions to improve consistency.

² The definition of this measure has been subject to change during this time series (see para 5.4.13–5.4.16).

- 5.4.14 As part of the revisions to this measure, changes have been made to the formulae for the number and severity of speed restrictions. The formulae now more accurately calculate the duration of speed restrictions by rounding to the nearest day rather than the nearest week. A more appropriate treatment of TSRs in place at the start of the reporting year has also been adopted.
- 5.4.15 The historic figures in the Annual Return 2003/04 have been restated to reflect the changes made to the formulae; however, it has not been possible to restate the 2001/02 figures as this would require TSR data from year-end 2000/01 which is not available.
- 5.4.16 These changes have had a minimal impact on the national figures reported. The variance between the national figures published in last year's Annual Return and this year's Annual Return is less than 1% for the total number of TSRs and total severity score in 2002/03.
- 5.4.17 However, at a more disaggregated level the changes have had a significant impact on the figures; for example, the number of Earthworks TSRs reported for Southern Region increased from 5 to 10. These TSRs do, however, account for a very small percentage of the overall TSRs.
- 5.4.18 The information presented in this measure is derived from the Weekly Operating Notice (WON) and amendments, control logs and wires which provide information on the imposition, removal and changes to TSRs.
- 5.4.19 All the Regions we have audited used Network Rail's Infrastructure Improvement Programme (IIP) database to record these TSRs. In Southern Region, speed restrictions which qualify for this measure are also recorded on a spreadsheet and cross-checked with the IIP database. All Regions we have audited used the IIP database as the source data, except for Southern which used its spreadsheet. Southern Region expects to use the IIP database for this measure in 2004/05.
- 5.4.20 Data is communicated from the Regions to HQ using reporting spreadsheets. HQ personnel manipulate the data using further spreadsheets and undertake an exhaustive process of formula-based and manual checking. Regional personnel provide corrections and clarification where appropriate. A full audit trail of changes made as a result of this process is maintained.

East Anglia Region

- 5.4.21 East Anglia Region was found to be compliant with the procedures and definitions for this measure. Within each of the maintenance depots in the Region there is a personnel member with specific responsibility for populating the IIP database. Local instructions for populating the database were in evidence. This is different from the other Regions we have audited where the database was managed centrally.
- 5.4.22 Sampled data from the IIP database at Tottenham Depot was accurately reflected in the HQ reporting spreadsheet.

London North Eastern Region

- 5.4.23 LNE Region was found to be compliant with the procedures and definitions for this measure. The IIP database was used for the full 2003/04 reporting year; prior years have used a legacy database. The reporting process is undertaken centrally by personnel responsible for TSRs management. Local instructions for managing the process were in evidence.
- 5.4.24 Personnel at HQ expressed concern that some of the relationships between 'predecessor' and 'successor' TSRs within the database might not be robust. This relationship identifies whether a TSR is new or an amendment to a previous one and therefore directly impacts on reported figures. However, we found no evidence of such a failure.
- 5.4.25 Sampled data from the IIP database in the Region was accurately reflected in the HQ reporting spreadsheet.

Scotland Region

- 5.4.26 During the 2003/04 year, responsibility for management of the reporting process moved from the 'Rolling Contact Fatigue & TSR' team to the asset knowledge team.
- 5.4.27 Scotland Region has its own procedure for this measure which dates from November 2002; the personnel responsible were not able to present a copy of the current procedure for this measure. This had no material effect on the reported values as the formulae used for calculating the measures in the reporting spreadsheet were consistent with the current procedure.
- 5.4.28 Sampled data from the IIP database in the Region was accurately reflected in the HQ reporting spreadsheet.
- 5.4.29 Scotland Region's Infrastructure Speed Removal Team showed best practice in TSR management, by using a further database to combine TSR data with the cost of TSRs to Network Rail as a result of Schedule 8 compensation payments to train operators under their track access agreements. The Infrastructure Speed Removal Team database also included a summary action plan for the removal of each TSR. This database generates daily and weekly reports showing the number of TSRs by location and affected customer, TSR removal performance by Business Unit and the delay minutes.
- 5.4.30 There was evidence of a very strong management focus on the removal of TSRs with TSR meetings held two to three times each week. This is evident in the reported figures which show that number and severity of the TSRs has almost halved.

Southern Region

- 5.4.31 In common with the other measures Southern Region has a local instruction which yields the same result as the ARM procedure. Personnel responsible had no record of the current procedure but did have a copy of the current definitions.
- 5.4.32 As noted above, Southern is the only Region not using the IIP database as source data. Speed restrictions which qualify for this measure are recorded on a spreadsheet; the spreadsheet is cross-checked with the IIP database each period and validated by route track engineers.
- 5.4.33 This parallel process is clearly an inefficient use of resources but an improvement on previous years where there were separate resources maintaining records of temporary speed restrictions and emergency speed restrictions. Southern Region expects to use the IIP database for this measure in 2004/05.
- 5.4.34 We believe the significant rise in reported TSRs and severity scores was due to falling water tables in the Region leading to drying of high clay content and consequent speed restrictions due to track and earthwork faults.
- 5.4.35 Sampled data from the IIP database in the Region was accurately reflected in the HQ reporting spreadsheet.

Confidence grades

- 5.4.36 Network Rail's Annual Return 2003/04 has proposed "an overall confidence grade of B3 for this measure with many Regions meeting a confidence grade of B2".
- 5.4.37 In all of the Regions we have audited we observed that the derivation of the data is robust and there is an in-depth iterative checking process in place between HQ and the Regions.
- 5.4.38 While it has not been possible to statistically quantify the accuracy of the data within each Region, we estimate the accuracy of the measure is within 5% for the Regions we have audited.
- 5.4.39 We note however the concerns expressed regarding the accuracy of the relationships held within the IIP database within LNE Region and concur with Network Rail's view that this measure should be graded at B3 to reflect the uncertainty surrounding the accuracy of the data in this Region.

- 5.4.40 We have therefore given this measure a confidence grade of B2 for each Region except LNE Region which has been graded as B3.

Observations

- 5.4.41 In Southern Region there were two parallel processes used to derive information on TSRs in the Region during 2003/04. We consider this to be an inefficient use of resources and observe that for the forthcoming year the data will be sourced from the IIP database.
- 5.4.42 The IIP database currently runs in Microsoft Access which can be unresponsive and unstable when running over a network. Network Rail has developed a substantially improved version of the IIP database; however, it is currently 'on hold' following the recent reorganisation within Network Rail. A decision has yet to be made whether to roll out this database using the new organisational structure or to develop a new Oracle database to handle TSRs. We hope that this will be resolved by next year.

Recommendations

- 5.4.43 Whilst the collection of the data within each Region and the calculation of the measure was found to be robust it is a time consuming process. In addition there are a variety of different methods used within the Regions to provide the data in a format consistent with the HQ reporting spreadsheet. We understand that Network Rail is considering collating the source data directly from the IIP database at HQ. We recommend that this change is undertaken, as it will be considerably more efficient and less prone to error.

5.5 Bridge condition index (M8)

Scope of audit

- 5.5.1 The audits looked at the source of the bridge condition data reported, the processes used for measurement and collection of the data and the completeness, accuracy and reliability of the data. Bridge condition is measured by the Bridge Condition Index which is known as Structures Condition Marking Index or SCMI.
- 5.5.2 During 2003-04 SCMI applied to underbridges and overbridges as in previous years. These descriptions include underbridges, overbridges, viaducts, arches, intersection bridges, viaduct intersections and side bridges.
- 5.5.3 The audits involved Network Rail Structures Maintenance personnel from East Anglia, London North Eastern, Scotland and Southern Regions, Network Rail personnel at HQ and personnel from the examinations contractors.

Annual Return 2003/04 results

Regulatory target

- 5.5.4 The regulatory target is defined as “No deterioration from a baseline average condition grade which will be established once a sufficient sample is achieved”.
- 5.5.5 As SCMI inspections have not been undertaken in a random manner, it is not possible to use the current average scores as a target; the current score would not be representative of the underlying population. It might be possible to use a weighted version of the existing score by correcting for any bias in the sampled population but this would be difficult. We believe that a target should not be set until the entire population is sampled.
- 5.5.6 Accumulation of a full set of SCMI data for the structures population was programmed to take six years, commencing in April 2001. At current rates, the SCMI programme will take longer than six years due to under achievement in earlier years in some Regions.

Results

- 5.5.7 SCMI scores for 3,718 under bridges and over bridges were reported for the 2003/04 year, bringing the cumulative total of reported SCMI scores to 10,407. The number reported this year is 13% less than last year but 162% more than 2001/02.
- 5.5.8 SCMI uses a grading system from 1-5, where 1 is the highest condition. The cumulative average condition grade for 2000-2004 is 2.0 which is unchanged from the previous grade of 2.0 for the period 2000-2003. Currently 58% of bridges scored are in condition grade 2 whilst 79% are in the top two grades. 98% are in grades 1-3.
- 5.5.9 Table 5.5.1 shows Scotland has undertaken 20.2% of the SCMI scores reported this year, a high productivity when compared with the other three Regions we have audited.

Region	Number of SCMI scores reported in 2003/04	% of total SCMI scores reported
East Anglia	336	9.0%
London & North Eastern	152	4.1%
Scotland	750	20.2%
Southern	211	5.7%
Other Regions	2,269	61.0%
Total	3,718	100.0%

Figure 5.5.1 SCMI scores reported in 2003/04 (source: Network Rail HQ Champion)

Findings

- 5.5.10 In all of the Regions that we audited we found a professional attitude at Network Rail and the examinations contractor. This has helped mitigate the impact of the commencement of new contracts within two Regions, large numbers of personnel vacancies within Network Rail and the impact of the reorganisation of Network Rail.
- 5.5.11 We observed the beneficial effects this year of the 10 year examination contracts, compared to earlier shorter contracts and believe the move to a 'cost plus' arrangement for payment has helped. However budgets were not always agreed and made available far enough in advance for the contractor to plan his work effectively. The examination contractors we audited showed a positive attitude to SCMI.
- 5.5.12 Our detailed findings, observations and recommendations are in Appendix D. We have summarised these findings below.

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The reporting year and progress against the 2003/04 plan

- 5.5.13 The ARM definition requires structures condition to be monitored against the annual planned target number of structures.
- 5.5.14 The February 2004 issue of the ARM definition changed the reporting year for SCMI from an April-March year to a year running from 15th February to 14th February; this has led to an under-reporting of this year's activity as inspections in the period 14/02/04-31/03/04 have been excluded. Figure 5.5.2 shows 3,897 examinations were to be undertaken in the year 2003/04 whilst 1,449 were reported in the Annual Return; reasons for this shortfall are noted below and in Appendix D.

Region	SCMI examinations included in Annual Return 2003/04				Total Reported in 2003/04	SCMI exams planned for full year 2003/04
	Exams from Apr01-Mar02 or earlier	Exams from Apr02-Mar03	Exams from Apr03-15Feb04			
East Anglia	133	169	34	336	878	
LNE	0	0	152	152	378	
Scotland	13	147	590	750	688	
Southern	0	0	211	211	1,953	
Total	146	316	987	1,449	3,897	

Figure 5.5.2 A comparison of SCMI examinations reported for/ undertaken in 2003/04

- 5.5.15 Figure 5.5.2 also shows 32% of SCMIs reported for this year (462 out of a total of 1,449) were carried out before April 2003.
- 5.5.16 The presentation of data in the Annual Return should include progress against workload for the reporting year and cumulatively, both to satisfy the ARM definition and to measure progress against the programme to inspect all bridges using SCMI. It did not contain this measure this year. We have included our detailed assessment of each Region's performance compared with planned workload in the appropriate Regional section of Appendix D.

Progress against the 6-year plan

- 5.5.17 The ARM definition requires the cumulative number of structures completed to be compared to the total structures population in order to assess progress towards completion of the 6 year programme of assessing the total structures population.
- 5.5.18 We have analysed the current progress, including all SCMI exams undertaken in 2003/04. We assessed progress against a theoretical 6-year programme where each year comprises one sixth of the total number of examinations required. For the four Regions we audit, progress is 31% behind programme. East Anglia is 9% behind programme, Scotland is 14% behind, Southern is 44% behind and LNE is 40% behind. Further detail is presented in Appendix D.

Tracking the plan in the SCMI database

- 5.5.19 Last year, we recommended the SCMI database and tool should be altered to improve the tracking of plans, examinations and the retention of an audit trail. The current database only attributes a "date of examination" to an entry. We would again recommend that the database is altered so:
- (a) An audit trail is retained for all previous examinations (date/ year planned and date achieved)
 - (b) The date of the next examination can be recorded.

Desktop and site audits

- 5.5.20 The current ARM procedure for SCMI requires Network Rail to carry out either desk top or site audits, but does not place a similar obligation on Network Rail's examinations contractor. We found that:
- (a) Network Rail uses a contractor to undertake an annual review of the process
 - (b) Both Network Rail and the examination contractors undertake desk top reviews of the SCMI examinations
 - (c) Within Network Rail, site audits were undertaken during the reporting year in LNE and Southern but not East Anglia and Scotland; however these site audits were limited in number and restricted in scope
 - (d) The four Regions we have audited are covered by two examination contractors, each covering two Regions. One of the contractors has recently introduced a programme of site audits however the other contractor has not.
- 5.5.21 We believe that desk top reviews alone are insufficient because limited checking of results is possible. SCMI can only be thoroughly checked during a site visit. We recommend a programme of site visits should be implemented throughout the Regions covering all SCMI examiners on a regular basis throughout the year. This audit should check SCMI sketching and assess the structure using the examiners original marking sheet as a reference. The audits should aim to cover around 4 or 5 SCMI structures from each examiner. It would be preferable if the examiner is present. This will help to ensure that the SCMI examinations are robustly undertaken and are consistent across the Regions; it will also indicate the accuracy being achieved on a regular basis which should help to improve accuracy.

Compliance

- 5.5.22 In each Region, the SCMI process involved Network Rail and an examinations contractor. Whilst overall the processes followed are similar, a summary for each Region is provided below and detailed commentary provided for each Region in Appendix D.
- 5.5.23 We found the results for two Regions were not correctly supported by a signed confirmation from the Region, as described in the procedure. In both cases the Region's return had a significantly higher number of SCMIs reported than was reported in the Annual Return caused by guidance from headquarters which appears to contradict the definition.
- 5.5.24 We identified duplicated and missing entries in the SCMI databases in two Regions. We recommend that all of the SCMI databases are thoroughly audited to ensure that they are accurate.
- 5.5.25 The results reported in the Annual Return were assembled by Network Rail's managing contractor, utilising downloads from the SCMI database in each Region. We found the Regions were 'detached' from the data and showed a lack of 'ownership'. We received comments such as "what was in the Return was not what was reported [to HQ]" and "what was in the return was not a reflection of what we did".
- 5.5.26 A report by Network Rail's managing contractor in 2003/04 shows there has been a moderate improvement in marking accuracy since the previous year and the required level of accuracy is not being achieved.

- 5.5.27 The ARM procedure requires that data is reported between HQ, contractors and Regions. We found the reporting of trend data was patchy and did not always follow the procedure. During the year, only limited data was reported between HQ, contractors and Regions, confined to the numbers of examinations completed; it was only at the end of the year that SCMI scoring data was reported.

SCMI User Group

- 5.5.28 The establishment of the SCMI user group since last year has provided a much needed source of technical guidance and established a forum for SCMI issues to be discussed and resolved. This is a welcome development, but all the Network Rail Regions and examinations contractors should be fully involved in it. Two of Network Rail's Regions are not represented on it and felt cut off from the user group.

East Anglia Region

- 5.5.29 In East Anglia Region a new examinations contractor was appointed on a 10 year contract in April 2003. Prior to this, another company had held a 2 year examination contract.
- 5.5.30 During the audit of Network Rail a number of duplicate entries in the SCMI database were identified. Most of the duplicate entries were arches with slightly different notation used in the two entries. There were also other notational errors requiring amendment. Following the audit, Network Rail carried out a reconciliation to identify these and remove them from the database. The number of entries in the database fell from 1,177 to 1,118, a fall of 5%.
- 5.5.31 878 SCMI examinations were due in 2003/04. This included around 200 additional examinations carried over from previous years. At the time of the audit 640 SCMI examinations had been carried out. The Region is 9% behind the target number of assessments for this measure; however, the contractor has a resourced plan in place to complete the work for 2003/04 and 2004/05 by the end of the 2004/05 year.
- 5.5.32 The commencement of the new contract and the recent de-merger from Eastern Region has adversely affected the SCMI process in East Anglia Region. It has taken most of the reporting year to resolve these issues.
- (a) As at our two previous audits in this Region there was a serious shortage of personnel in the Network Rail bridge maintenance team. The reorganisation in April 2003 had established a realistic sized team but this had not been resourced. Throughout 2003/04 there was a serious shortage of personnel, leaving insufficient personnel to manage a demanding workload.
 - (b) It was clear that Network Rail personnel had prioritised the work to process examinations and deal with safety critical work. However this left establishing documented systems, reviewing SCMI and site audits of the contractors work in SCMI as lower priority work, which has suffered badly during 2003/04. No site audits were undertaken by Network Rail during the reporting year. The problems caused have been further compounded by the inadequate resources allocated to the administration team for the East Anglia examinations contract.
 - (c) The examinations contractor's start-up in April 2003 was slow, compounded by the inheritance of personnel from the previous contractor and by changing the arrangements for contract administration. This delayed the establishment of a proper administrative set up for the contract until mid way through the 2003/04 year.
- 5.5.33 Within the examinations contractor, we found that there was a positive attitude to the examinations and SCMI workload. Plans were in place to fully instigate procedures and systems and recruit more examiners. A recovery plan is in place to eliminate the current backlog of examinations. The new 'cost plus' method of payment appears to have had a beneficial effect on work achieved.

- 5.5.34 The examinations contractor estimates that it will take to the end of 2004/05 to clear the 2003/04 backlog and complete the 2004/05 work. Technical checking has been introduced by the contractor and a programme to audit all of the examiners in SCMI was about to start. There were encouraging signs in the transfer of knowledge to the examiners via examiner briefings. Some of these efforts will have had only a small effect in the 2003/04 year.

London North East Region

- 5.5.35 In London North Eastern Region the new examinations contractor has been appointed on a 10-year contract. A major problem during the reporting year was the limited examiner resources inherited by the examinations contractor combined with the small number of SCMI examinations undertaken in previous years.
- 5.5.36 The problem has been managed this year by a flexible approach agreed with HMRI, whereby compliance will be achieved on examination dates by the end of 2006/07, which matches the examinations contractors' resources but does not even out the workload across all years.
- 5.5.37 Network Rail and the examinations contractor derived a workable task list which matched available resources. This revised list had approximately 900 detailed examinations with SCMI, which was around 40% of the original target number of detailed examinations. The revised list required 378 SCMI examinations.
- 5.5.38 A total of 1,237 audits will be recorded in the database once all of the 378 undertaken in 2003/04 have been entered. The total of 1,237 is 40% below the number required to meet the target to examine all assets within 6 years.
- 5.5.39 A six-year plan has been agreed between Network Rail and the examinations contractor to achieve an even work load starting in 2004/05. This is not compliant with the ARM procedure as all of the examinations will not have been undertaken by 2006/07.
- 5.5.40 There were a number of vacancies within the Network Rail structures maintenance team throughout the reporting year and posts that became vacant during the year were not filled because of a recruitment freeze pending a reorganisation.
- 5.5.41 The basic procedures and systems for the examinations process were in place at Network Rail although a general update was underway. At the examinations contractor further development work is required on the basic procedures.
- 5.5.42 Network Rail audited the operations of the examinations contractor in late 2003 using a Network Rail audit protocol. The audits included a selective review of SCMI sketches and scoring on site which found labelling errors; scoring checks were better than had been expected. No formal observations were made and no non-conformity reports were issued.
- 5.5.43 The examinations contractor's start-up in April 2003 was slow, compounded by the inheritance of personnel from the previous contractor; the delay in the establishment of a realistic task list also caused problems. There was however a positive attitude to the examinations tasks and SCMI and a lot had been achieved in setting the project up properly to tackle the workload.
- 5.5.44 Technical briefings of the examiners by the office engineering and project management teams take place every three months. These include SCMI and examinations and are a welcome development.
- 5.5.45 The LNE Region is not represented on the SCMI User Group.

Scotland Region

- 5.5.46 The incumbent examinations contractor continued their role in Scotland with a new ten-year contract from April 2003. The SCMI examinations in this Region were not affected by any significant contract start up issues.

- 5.5.47 Progress in SCMI as reported in the Annual Return was encouraging and by the time of the audits progress was good; the 2003/04 work was complete on site, as was the backlog from previous years, although some data had yet to be run through the SCMI tool and into the database. A total of 2,026 audits will be recorded in the database once all of the examinations undertaken in 2003/04 have been entered, 14% behind the target.
- 5.5.48 Carry over to the following year has largely been avoided. This has been achieved partly by rescheduling examinations within the year and by an increase of resources at the examinations contractor. The increase of resources was in anticipation of extension of SCMI to further groups of structures in 2003/04 but which did not materialise.
- 5.5.49 Basic procedures and systems for the examination process were in place at the examinations contractor, but with some revisions and updating required. Improvements had been made at Network Rail since last year, although there was still a significant way to go.
- 5.5.50 There was a serious shortage of personnel in the Network Rail bridge maintenance team throughout the 2003/04 year. The team structures set up from April 2003 had established a realistic sized team but this had not been resourced.
- 5.5.51 It was clear that the personnel had prioritised the work to process examinations and deal with safety critical work. However this left establishing documented systems, reviewing SCMI and site audits of the contractors work in SCMI as lower priority work, which has not had the attention it required during 2003/04.
- 5.5.52 Site audit visits on SCMI have not been undertaken by Network Rail during 2003/04. This was primarily due to:
- (a) The high number of vacancies
 - (b) An HMRI improvement notice for backlog of examination reports to be signed off and appropriate works recommended.

Southern Region

- 5.5.53 In Southern Region, the examinations contractor continued their role from the 2001/03 contract into the ten-year contract that started in April 2003. The Region did not have the significant start up issues experienced in East Anglia and LNE Regions.
- 5.5.54 The examinations contractor realised just prior to the audit that there was a significant amount of data missing from the database. This is a significant cause for concern.
- 5.5.55 1,953 SCMI examinations were due in 2003/04. Of these only 975 were examined during the year. The 978 examinations not undertaken have not all been carried forward automatically into 2004/05 but are being risk assessed and allocated an examination date over the next 2 years.
- 5.5.56 The significant shortfall was primarily a result of the late confirmation of the budget which was not sufficient for 1,953 examinations. The budget was confirmed eventually, but was approved too late to prevent the examinations contractor seconding personnel elsewhere.
- 5.5.57 A total of 2,758 SCMIs were in the database following an audit by the examinations contractor. When all of this year's audits are included this will rise to 2,859; however this is still 44% fewer than the number required to meet the 6-year examination target.
- 5.5.58 This shortfall includes 475 SCMI examinations that should have been carried out in 2001/02 and 2002/03. These were not programmed in 2003/04 and are in a Network Rail risk assessment process for carrying forward and allocating an examination date.
- 5.5.59 Basic procedures and systems for the examination process were in place at both at the examinations contractor and Network Rail, although at the latter some further work and updating were required.

- 5.5.60 The examinations contractor has SCMI expertise in house. One of their area examining managers comes from a background of developing SCMI and issues advice notes to examiners. Consideration should be given to making these available more widely to Network Rail Regions and other examination contractors.
- 5.5.61 Early in the 2003/04 year, audits were undertaken by Network Rail at around 10 bridges to check sketches and review scoring. The results were not run through the SCMI tool or followed up with the examinations contractor. Resourcing constraints have prevented further checking and audit of the work.
- 5.5.62 The examinations contractor recognises that site audits to check sketches and marking are best practice but “did not expect it to happen in the near future”.
- 5.5.63 The Southern Region is not represented on the SCMI User Group.

Confidence Grade

- 5.5.64 We assessed the confidence grades in the data as:
- (a) East Anglia Region: B3
 - (b) London North Eastern Region: B4
 - (c) Scotland Region: B4
 - (d) Southern Region: B3

Recommendations and observations

- 5.5.65 We believe a target of B3 should be achievable for measure M8. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
- 5.5.66 Graphical representation of the SCMI results was included in the Annual Return for the first time. We recommend graphical representation by Region should also be included.
- 5.5.67 The data reported this year was a mixture of 2003/04 work banks and work done in previous years. We recommend the presentation of SCMI data in the Annual Return should include achievement against workload by year and cumulatively both to satisfy the ARM definition and measure progress.
- 5.5.68 We recommend the SCMI databases within the Regions should be subject to detailed audit to ensure that the errors noted in our report are not prevalent.
- 5.5.69 We recommend the SCMI database should be updated so that a clear audit trail of which SCMI examinations were reported to the ORR in which year is maintained. This was raised in last year’s audit report.
- 5.5.70 Due to the timing of the Annual Return there was a significant discrepancy in some Regions between the SCMI data signed off by the Region and that contained in the Annual Return. We recommend that the Annual Return should reflect the data that is signed off by each Region and which the Region has compiled and “owns”.
- 5.5.71 We recommend that regular site audits should be undertaken by both Network Rail and the examinations contractors. The audits should check the SCMI sketching and the marking of the structure using the examiner’s original marking sheet as a reference and should cover all examiners during the year. This is to monitor the accuracy throughout the year in the Region and would replace Network Rail’s reliance on the managing contractor’s annual report.
- 5.5.72 Guidance notes on SCMI have been developed by one of the examination contractors. We recommend that these should be disseminated more widely.
- 5.5.73 The establishment of the SCMI user group since last year has provided a much needed source of technical guidance and established a forum for SCMI issues to be discussed and resolved. We recommend all Network Rail Regions should be represented on this body.

- 5.5.74 We recommend that the year of SCMI results reported should be 1st April to 31st March each year so that it aligns with the examinations year.
- 5.5.75 We consider that written procedures and a competency management system at Network Rail and the examinations contractors are necessary for SCMI. We recommend that these are established.

5.6 Signalling failures (M9)

Scope of audit

- 5.6.1 The scope of this audit was to verify the accuracy of data and commentary reported in Network Rail's Annual Return 2003/04, Section 2, Signalling Failures (M9), including Table 36. The definition and procedures for this measure are documented in RT/ARM/M9DF and RT/ARM/M9PR. Audits were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions during May and June 2004.
- 5.6.2 This measure reports the total number of signalling failures that cause more than 10 minutes delay on Network Rail's infrastructure (hereafter referred to as signalling failures).

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Regulatory target

- 5.6.3 The regulatory target for signalling failures is to maintain the network at or below the baseline level of 25,106 recorded in 2000/01. This target is subject to a tolerance of $\pm 7.3\%$.
- 5.6.4 The reported figure for 2003/04 is 28,098, which is almost 12% higher than the target and outside the tolerance. The regulatory target for signalling failures has not been met.
- 5.6.5 If signalling failures are adjusted to reflect growth in rail traffic since 2000/01 to reflect the number of signalling failures causing over 10 minutes delay per million train kilometres then the 2003/04 figure is 5% worse than in 2000/01.

National performance

- 5.6.6 Figure 5.6.1 shows the year on year national trend against the regulatory target. Following a 16% increase between 2000/01 and 2002/03, there has been a 3% reduction in 2003/04. For the last three years the measure has been in excess of the upper tolerance bound.

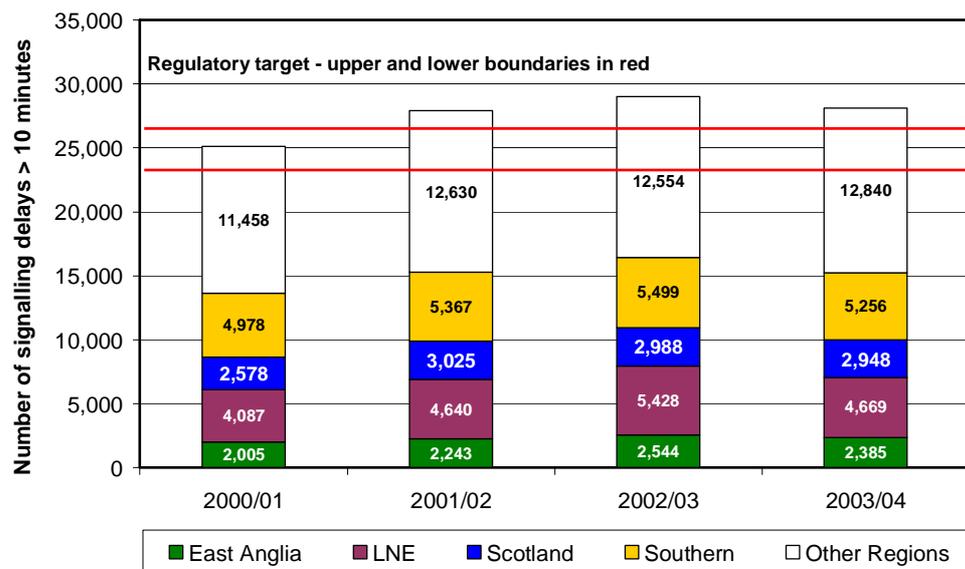


Figure 5.6.1 Delay caused by signalling failures (>10min only)

Regional performance

5.6.7 Figure 5.6.2 shows the national trend is largely repeated for the audited Regions. Signalling failures causing more than 10 minutes delay increased between 2000/01 and 2002/03 before falling this year, except for Scotland Region where delays recorded under this measure peaked in 2001/02. This is also the trend when signalling failures are adjusted for traffic growth.

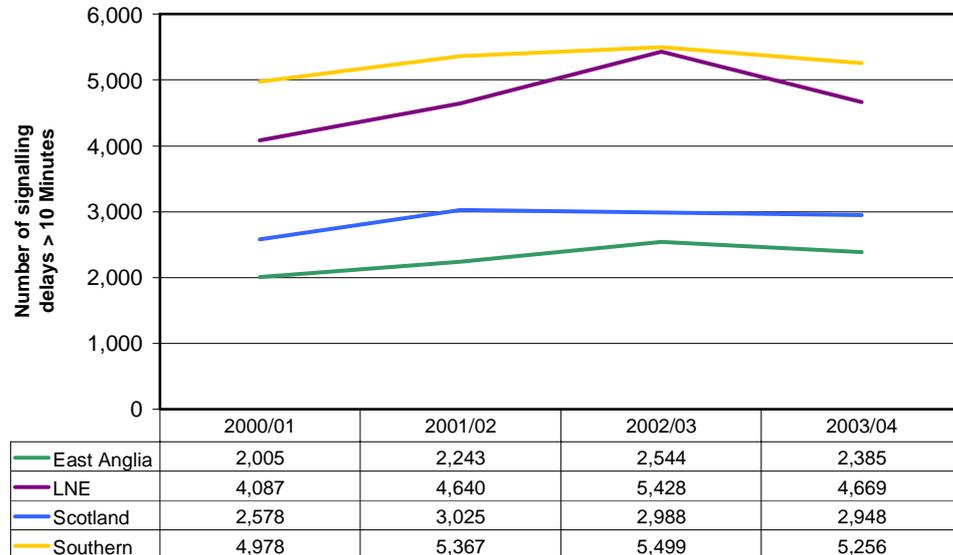


Figure 5.6.2 Delay caused by signalling failures (>10min only)

- 5.6.8 This trend was forecast in last year's report. A large volume of new TPWS equipment was commissioned during 2000/01 and 2002/03. Failures due to the installation process and/or the operation of novel equipment often lead to high initial failure rates. Improvements in 2003/04 are likely to have been caused by the TPWS equipment 'bedding-in'. The initial part of the 'bathtub curve' of asset performance has run its course, with improvements visible in reduced delays this year.
- 5.6.9 We have compared the performance of the signalling assets recorded under this measure with the total signalling related delay minutes published in the operational performance section of the Annual Return. All signalling failures related to delay categories 301A (signal failures), 301B (track circuit failures), 302A (signalling system and power supply failures) and 302B (other signal equipment failures) fell by a total of 2.5% in 2003/04, which is consistent with the 3% reduction in delays greater than 10 minutes recorded under this measure.
- 5.6.10 We note commentary within the Annual Return inferring a correlation between signal failures and downtime information from FRAME. We have been unable to evidence this claim but note that these two statistics could be consistent. However the average minutes lost per incident can vary enormously depending on when it occurs. If a fault occurs at the end of the rush hour its effect is much smaller than if it occurs one hour earlier, so to some extent it is problematic to draw comparisons.

Findings

Process

- 5.6.11 The data acquisition, manipulation and control mechanisms for this measure have not materially changed this year. For all Regions the delay data is sourced from TRUST using delay categories specified in the definition of the measure.

- 5.6.12 We found that the numbers for this measure provided in the Regions matched those contained in the Annual Return and the flow of information from the Regions to HQ seemed to be robust.
- 5.6.13 We are aware that the use of KPIs linked to remuneration has led to a concerted effort on the part of signal engineers to more accurately define the items recorded in TRUST for points failure (delay category 101) and track circuit failure (delay category 301B).
- 5.6.14 Allocation of delay to these categories is based on the Delay Attribution Guide (DAG) and the delay attributor's knowledge of the root cause. We found that allocation of delay to signalling delay categories as defined in the DAG was not always appropriate, for example:
- (a) Track faults which cause points failure are categorised as signalling failures even if there is no signalling fault.
 - (b) Track circuit failures which were not signalling related are categorised as signal failures.

We have noted this issue in previous years.

- 5.6.15 This year, two Regions have specifically examined the accuracy of the delay attribution process for signalling failures.
- (a) East Anglia Region compared TRUST delay data with FRAME failure data for points and track circuit failures over an 18 month period. This review established an engineering root cause for each delay to compare with that applied by TRUST delay attributors using the DAG. The number of delays greater than 10 minutes attributed to signalling by the engineers in one year was around 600 failures lower than those reported in TRUST. This represents a 25% reduction in figures reported for this measure. However, as TRUST data is the formal source for this measure, these revised figures have not been used in the reporting of M9 for East Anglia.
 - (b) LNE Region undertook a review of compliance with the DAG for 2003/04 delays attributed to signalling. Some guidance within the DAG was found to be open to interpretation, with evidence of regular misallocation of delay; also, TRUST records were not updated to reflect further emerging information on root cause. The review delivered a 9% reduction in reported signalling delays for this measure through correct allocation of delay in compliance with the DAG. LNE Region has subsequently developed a set of supplementary guidelines for delay attributors on the correct allocation of delays.

East Anglia Region

- 5.6.16 Figures for delay caused by signalling failure are generated by the Regional signal engineering team using information provided by the Regional performance team. This is not consistent with the procedure, which describes no input from the Regional signal engineering team. We found no evidence that this impacts upon the figures reported.
- 5.6.17 Delays attributed to signalling failures recorded for this measure have fallen by 6% but remain 19% greater than in 2000/01. This is partly due to an increase in equipment population due to TPWS fitment but is also due to continuing problems with recently renewed equipment and Solid State Interlocking modules failing in hot weather.

London North Eastern Region

- 5.6.18 Delay data is provided by the Regional performance team in compliance with the procedure.
- 5.6.19 Delay attributed to signalling failures recorded for this measure fell by 14% in 2003/04. A significant part of this reduction is explained by the delay attribution review undertaken, described above. The remainder is largely ascribed to reduced failure rates of TPWS equipment.

Scotland Region

- 5.6.20 Scotland Region did not have the latest version of the procedure for this measure; however, this has not impacted the figures reported.
- 5.6.21 Scotland has an internal KPI for 'delay caused by signalling failures', based on the engineering root cause rather than root causes ascribed by delay attributors. We believe this KPI is a more accurate indicator of signalling asset failure than the current M9 measure. We note the duplication of effort required to report both the internal KPI and the M9 measure.
- 5.6.22 Delays attributed to signalling failure recorded for this measure are similar to 2002/03, showing a reduction of just 1%; however, this represents a reduction of around 5% when normalised by the number of train kilometres run on the Region.

Southern Region

- 5.6.23 Signalling failures were broadly in line with expectations, showing a reduction in those due to TPWS fitment but offset by an increase due to last summer's hot weather. Delays reported under this measure are within the 7.3% tolerance.
- 5.6.24 Southern undertake a "near 100%" check of delays attributed in TRUST against the root causes recorded in the FRAME fault reporting system within 48 hours of the incident to increase the accuracy of delay attribution. This process is not undertaken in the other Regions we have audited. This reconciliation process is labour intensive but would be appropriate to the closely-integrated densely-operated Southern Region where failures are likely to have a greater impact on customers than on 'main line' orientated Regions.
- 5.6.25 It would be sensible to identify and compare any cost-benefits from the enhanced attribution processes in LNE and Southern.
- 5.6.26 The enhanced attribution process and consequent confidence in the data has encouraged Southern to use this measure as an internal KPI, unlike other Regions we have audited.

Confidence grade

- 5.6.27 Network Rail has given this measure a confidence grade of B2 at national level with Regional figures graded at B3. We believe that these grades are optimistic given our findings during the audit process this year.
- 5.6.28 An error of 9% was internally identified in the delay attribution process in LNE; an internal review in East Anglia revealed that one quarter of delays attributed to signalling were not related to signalling failures, despite the allocation of delay being generally consistent with the DAG. The extent of variance between the delays recorded in TRUST and the engineers' view of delays caused by signalling gives us significant concerns about the ability of the measure to provide an accurate record of the impact of signal failures on operational performance.
- 5.6.29 In light of this, we have given this measure a confidence measure of B4 for all Regions.

Recommendations & observations

- 5.6.30 We believe a target of B3 should be achievable for measure M9. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
- 5.6.31 The audit of delay attribution processes undertaken in LNE Region revealed a 9% mis-attribution of delay for measure M9. We recommend that the guidelines developed in LNE should be assessed with a view to implementation across the network, to improve the consistency of signalling delay attribution.
- 5.6.32 There is a significant gap between the engineering view of signalling caused delays and those recorded in TRUST for measure M9. This could be partly addressed through a formal reconciliation with FRAME however changes would also be required to the Delay Attribution Guide so that the delay attribution process reflected the 'engineering view' on the root cause of delays.

- 5.6.33 We believe that there is significant benefit in undertaking a review of the Delay Attribution Guide for signalling failures measure M9, as this would provide a more accurate measure of the failure rates of signalling assets to the ORR and increase signalling engineers' 'buy-in' to measure M9.
- 5.6.34 We note that Network Rail is considering enhanced functionality and replacement systems for FRAME and TRUST. We believe delay and failure data should be held in such a way as to make their reconciliation easy; an accurate delay attribution process is necessary for customer-focussed asset management.

5.7 Signalling asset condition (M10)

Scope of audit

- 5.7.1 The scope of this audit was to verify the accuracy of data and commentary reported in Network Rail's Annual Return 2003/04, Section 2, Signalling Asset Condition (M10), including Tables 37-38. The definition and procedures for this measure are documented in RT/ARM/M9DF and RT/ARM/M9PR. Audits were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions during May and June 2004.
- 5.7.2 This measure assesses the condition of signalling assets, based on the residual life of equipment in a signalling interlocking area, using a methodology called Signalling Infrastructure Condition Assessment (SICA). The SICA assessment focuses on the condition of the interlocking but also includes the condition of lineside equipment.
- 5.7.3 Due to the low number of SICA assessments undertaken this year we have not sought to undertake site visits. The focus of this year's audit has been:
- To ensure that the data prepared in the Regions is accurate and based on established processes.
 - To establish whether the recommendations we have made in previous audit reports have been implemented.

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Regulatory target

- 5.7.4 The Annual Return notes that no regulatory target has been set for this measure and suggests an insufficient sample size has been assessed. As 75% of the current population of interlockings have been inspected we believe a target should be set.

National performance

- 5.7.5 The results for this measure are published as the average score for all assessments undertaken since 2000/01. The average condition of assets inspected has been falling over the last three years; the condition grade has increased from 2.3 in 2000/01 to 2.5 this year. As figure 5.7.1 shows, this is due to an increase of assessments graded in band 3 and a decrease of assessments in band 2.

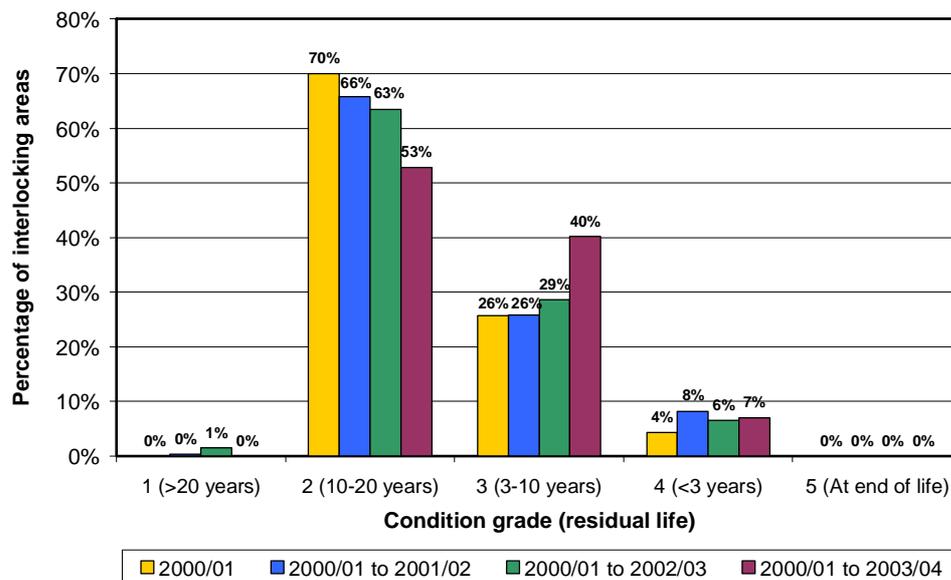


Figure 5.7.1 Average signalling asset condition

Proportion of interlockings assessed

- 5.7.6 The population of interlockings in each Region changes each year as signalling schemes are commissioned and old interlockings replaced. The percentage of interlockings assessed in some Regions has fallen this year. In East Anglia, all interlockings were assessed by the end of 2002/03; this has fallen to 95% this year because:
- (a) The West Anglia Route Modernisation project has been finished; this involved replacement of interlockings which were included within last year's Annual Return
 - (b) No SICA assessments were undertaken this year.
- 5.7.7 All Regions expect to assess 100% of interlockings by 2006 as specified in the procedure.

Accuracy of national average score

- 5.7.8 SICA 2B assessments of Great Western Region interlockings from the period 1996-2001 have been retrospectively included this year. A total of 179 of these assessments have been included in this year's figures.
- 5.7.9 Great Western Region is not within the scope of our audits; however, inclusion of the SICA 2B assessments undertaken in the Region impact on the national score. The average score of the SICA 2B assessments in the Region is 3.1. This is significantly worse than the Great Western average score of 2.6 using the pSICA and sSICA assessments alone. It is not clear if this difference is due to the difference in the assessment processes or reflects the actual asset condition.
- 5.7.10 If these SICA 2B assessments are removed from the national average it improves by 3% from 2.54 to 2.46. However, the reported score would remain unchanged as this measure is reported to one decimal place.
- 5.7.11 Notwithstanding this, inclusion of retrospective assessments from 1996-2001 solely in the 2003/04 year has invalidated the published time series of Great Western and national scores in this year's Annual Return; the assessments should have been allocated to the year in which they were conducted and the historical data restated as appropriate.

Regional performance

- 5.7.12 Figure 5.7.2 shows the average grades for each of the Regions we have audited and the national average for assessments undertaken between 2000/01 and 2003/04. The average grades show little variance between Regions; East Anglia has a worse average condition than the national average and other Regions we have audited.

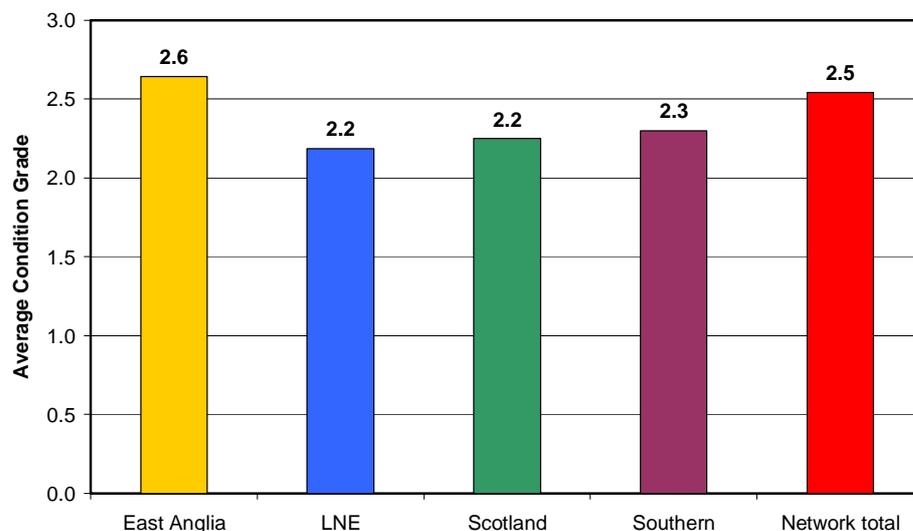


Figure 5.7.2 Average signalling asset condition

Findings

Previous Recommendations

- 5.7.13 During last year's audit programme we undertook site visits to establish the accuracy of the SICA assessment process. In our 2002/03 audit report we made a number of recommendations to significantly improve the SICA process and the accuracy of the data published in the Annual Return.
- 5.7.14 We note that our previous recommendations have not been implemented. Our findings from last year remain valid:
- (a) Headquarters audits have not been undertaken, as required by the procedure governing this measure, to improve the consistency of the SICA process across the Regions
 - (b) Questions within the SICA assessment which refer to more than one issue have not been split, this leaves the assessor able to choose which issue to score, leading to inconsistency of results
 - (c) No account is taken of caveats or notes made by assessors when calculating the residual life generated by the SICA assessment. This can have a significant impact where a calculated residual life is dependent upon life extension works being undertaken
 - (d) The results presented in the Annual Return reflect the average score from three different SICA methodologies. These are not easily comparable methodologies; the results should be presented separately
 - (e) No work has been undertaken to establish whether it is possible to normalise the outputs from the different SICA methodologies.

Asset Reporting Manual

- 5.7.15 The only change to the procedure and definition for this measure has been the inclusion of SICA 2B assessments, noted above. Data collection and processing within the audited Regions and at Headquarters has not materially changed for this year.
- 5.7.16 Network Rail remains non-compliant with the procedure for this measure. The procedure requires Headquarters personnel to undertake audits for a sample of SICA assessments. As in previous years, these audits have not taken place, despite recommendations in our last two reports that these audits should be undertaken. We believe Headquarter's auditing is a necessary feedback loop in the process, to establish consistency and remove personal bias from what is inevitably a somewhat subjective assessment process. Personnel at Network Rail Headquarters have (again) asserted that they intend to undertake audits this next year for this measure. We look forward to seeing the outputs of these audits for next year's Annual Return.
- 5.7.17 During our site visits last year we found that interpretation of some of the SICA questions was significantly different across Regions and no formal training programmes in place for the SICA assessment process. As the assessment process is subjective, we suggest a mentoring and formal training is necessary to establish consistency across Regions and between individual assessors. This would be of particular value for:
- (a) Wire degradation, which is one of the more subjective areas of the assessment
 - (b) The extent to which outside equipment is included in the assessments.
- 5.7.18 We also found some Regions arrange for SICA Assessors to cover each others' areas in order to establish a more consistent approach to the assessments. We suggest Network Rail should consider incorporating this best practice into a mentoring and training programme.

- 5.7.19 We note that residual lives established using the pSICA tool are adjusted by a factor of 0.775 for consistency with the more detailed sSICA and SICA2B assessments. This is not apparent from the procedure or definition. This adjustment factor has been used since 2000/01 and reflects that the pSICA tool takes no account of patchwork necessary on the interlocking and therefore overstates the residual life. The adjustment factor was derived from analysis and comparison of historic assessments and has not been updated since.
- 5.7.20 We continue to be concerned with the SICA tools. We understand a new version of pSICA is due to be issued. Although we have not yet had the opportunity to review this version, we trust that it will incorporate the enhancements recommended in our 2002/03 report.
- 5.7.21 As part of the audit we undertook a review of the Headquarters database which records all SICA assessments undertaken in the Regions. While the database accurately calculated the SICA scores there is a significant amount of manual calculation. In addition, adjustments are made to some of the SICA scores prior to entry in the database in order that the database generates the correct condition grade. No record of these amendments is recorded in the database.
- 5.7.22 Both of these issues increase the risk of errors occurring in the reporting process and reduce the robustness of the audit trail.

East Anglia Region

- 5.7.23 No SICA assessments were undertaken during the 2003/04 year; however, 100% of interlockings had been assessed at the end of 2002/03.
- 5.7.24 The West Anglia Route Modernisation scheme replaced a number of signal boxes with four new interlockings which have not yet been assessed. Once these assets are assessed we would expect the average condition in the Region to improve and the reported score reduce.
- 5.7.25 In previous years, SICA assessments have been undertaken by external consultants, supported by analysis of the service and safety history for each interlocking using data from FRAME. The reports produced were comprehensive and subject to review by Regional engineers. For the forthcoming year's SICA assessments, East Anglia Region plans to produce similar reports. We support this.
- 5.7.26 A sample of SICA assessments were checked against the Headquarters reporting database. The database contained two errors for the Thetford assessment from November 2002: the SICA score itself and the year it was included in the Annual Return. Whilst this is a cause for concern, suggesting that the data management processes for this measure are fallible, it did not have a material impact on the condition grade recorded.

London North Eastern Region

- 5.7.27 LNE Region undertook 84 SICA assessments for this reporting year. Three months of the SICA assessment programme were cancelled due to a reorganisation; however, the Region remains confident of achieving 100% coverage by 2005.
- 5.7.28 LNE is the only Region we audit to build a comprehensive renewals programme primarily based on the SICA examinations. We would note that the SICA assessment process are not be exclusively used to identify signalling renewals as one of the key drivers for renewal – inability to maintain assets due to their technical obsolescence – is not given sufficient weighting in the SICA process to use it exclusively. However, we believe Network Rail should consider using SICA as the primary source for systematically compiling signalling renewals programmes.
- 5.7.29 A sample of SICA assessments were checked against the Headquarters reporting database and were found to be correctly recorded.

Scotland Region

- 5.7.30 Scotland Region undertook three SICA assessments in accordance with previous SICA assessments which had indicated they should be assessed in 2003/04. However, no plans were made to meet the internal target of undertaking 35 assessments in 2003/04; this target was therefore not met. We were informed that this 91% shortfall was due to the re-organisation and insufficient trained assessors.
- 5.7.31 In last year's audit report we noted that some of the SICA assessments undertaken in the Region were pessimistic in contrast with the other Regions we have audited. This pessimism was caused by the method of answering SICA questions which refer to more than one asset. Scotland assessors used the worst asset condition score in contrast to other Regions where the average asset condition score was used. We believe that SICA questions referring to more than one issue should be split to ensure consistency of results.
- 5.7.32 As part of the reorganisation, Scotland Region has allocated responsibility for management of the SICA process to the Signal Renewals Asset Engineer. This was not the case in other the Regions we have audited. We believe Network Rail should consider using this best practice nationally.
- 5.7.33 A sample of SICA assessments were checked against the Headquarters reporting database and were found to be correctly recorded.

Southern Region

- 5.7.34 Southern Region undertook 12 SICA assessments for this reporting year.
- 5.7.35 During 2003/04, the Region has started to use SICA assessments as the primary source of condition data for their level crossing renewal programme. Previously, a parallel condition assessment process has been undertaken for this purpose. We look forward to seeing this use of SICA assessments extended to the remainder of the signalling renewal programme.
- 5.7.36 A sample of SICA assessments were checked against the Headquarters reporting database and were found to be correctly recorded.
- 5.7.37 Analysis of the Headquarters reporting database revealed two interlockings in the Region recorded with a negative residual life: Sowdon Colliery and Betteshanger Colliery. We understand that these assets are mothballed and have not been formally signed out of use. We are therefore surprised to note that these have been recorded as condition grade 4 not condition grade 5. This is inconsistent with procedure Network Rail/ARM/M10PR which states that assets at the end of their life are grade as band 5.

Confidence grade

- 5.7.38 Discussions regarding the confidence grades for this measure were held with Headquarters and those Regions which had attributed a grade.
- 5.7.39 We believe a grade A for process reliability is not warranted for this measure since:
- The assessment methodology is based on a sampling process.
 - Reported scores are based on assessments from current and previous years; annual assessment of each installation has been judged impractical.
- 5.7.40 We have therefore scored the underlying process at grade B; those Regions where few or no assessments have been undertaken this year have been scored as grade C as the degree of extrapolation is greater.
- 5.7.41 The methodology is based on subjective assessments by more than one person with little evidence of training or audit regimes to improve consistency of application. We believe signalling asset condition using this method is assessed within a 10% to 25% accuracy band – equivalent to an accuracy grade of 4.
- 5.7.42 The confidence grades assigned for this measure are B4 for LNE and Southern Regions; C4 for Scotland and East Anglia Regions.

Recommendations & observations

5.7.43 We note the extensive recommendations that we made last year have not been implemented. The priority recommendations made last year are reiterated below:

- (a) The audit process defined in the procedure documentation RT/ARM/M9PR has not been implemented. It is critical that this is implemented for the forthcoming year in order to improve the consistency and reliability of assessments undertaken in the Regions.
- (b) Questions within the SICA assessment which refer to more than one element should be split so that they refer to just one element. This will improve the consistency of assessments across the Regions.
- (c) The SICA assessment should take into account any caveats or notes applied to the residual life generated. This is particularly important where the residual life stated is subject to life extension works.
- (d) The results presented in the Annual Return reflect the average score from three different types of SICA assessment. These are not necessarily comparable and the results should be presented separately.
- (e) Work should be undertaken to establish whether it is possible to normalise the outputs from the difference SICA assessments to allow a more consistent set of condition assessments to be generated.

5.7.44 We also have a number of additional recommendations from this year's audit:

- (a) We believe a target of B4 should be achievable for measure M10 in its current form. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
- (b) The procedure and definition should be amended to formalise the current practice of applying adjustment factors to pSICA scores. The documentation for this measure is deficient until this recommendation is completed.
- (c) The adjustment factor applied to pSICA residual lives should be reviewed in light of the last four years of condition assessments. This will improve accuracy for this measure.
- (d) The definition of condition band 5 should be clarified and the scores for Sowdon Colliery and Betteshanger Colliery adjusted if appropriate.
- (e) The historic data for this measure should be restated, reporting SICA 2B assessments for the year in which they were undertaken. The reported data will otherwise overstate the number of assessments undertaken in 2003/04.
- (f) An interim regulatory target – or methodology for determining this target – should be developed as a large proportion of assets have now been assessed. This should take into account differences between the SICA methodologies used during the assessment programme.
- (g) The data management process for this measure should be reviewed, particularly data manipulation and storage in the Headquarters reporting database. This should focus on reducing manual data processing, a data validation process to reduce errors, ensuring data integrity for assessments which are no longer included in the current average score (as the assets have been decommissioned or replaced). This will ensure a robust audit trail is retained for previous and future Annual Returns.
- (h) Accountability and responsibility for future SICA assessments should be allocated to templated posts in the new organisation. We note, however, that it may be necessary to delegate these responsibilities to ensure the extensive knowledge base of existing SICA assessors is not lost from the process.

5.8 Traction power incidents causing train delays (M11 & M12)

Scope of audit

- 5.8.1 Audits of the Annual Return 2003/04 data and processes for these measures were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions.
- 5.8.2 Measure M11 records the number of overhead line equipment related incidents that result in more than 500 minutes of delay. M12 is the equivalent measure for conductor rail incidents. Both measures exclude incidents due to defective train operator equipment, outside parties, animals and those arising as a direct result of extreme weather conditions and other electrification and plant equipment failures.

Annual Return 2003/04 results

Regulatory target

- 5.8.3 The regulatory target for both these measures is to maintain the network at or below the baseline level reported for 2000/01.
- 5.8.4 Due to the low number of incidents reported for these measures the statistical tolerances for these measures are substantial; 28% for M11 and 47% for M12.
- 5.8.5 For both of the measures, the number of incidents recorded this year is less than the number recorded in 2000/01 but higher than the lower tolerance bound for the measure.

Results

- 5.8.6 Figures 5.8.1 and 5.8.2 summarise the results for these measures.

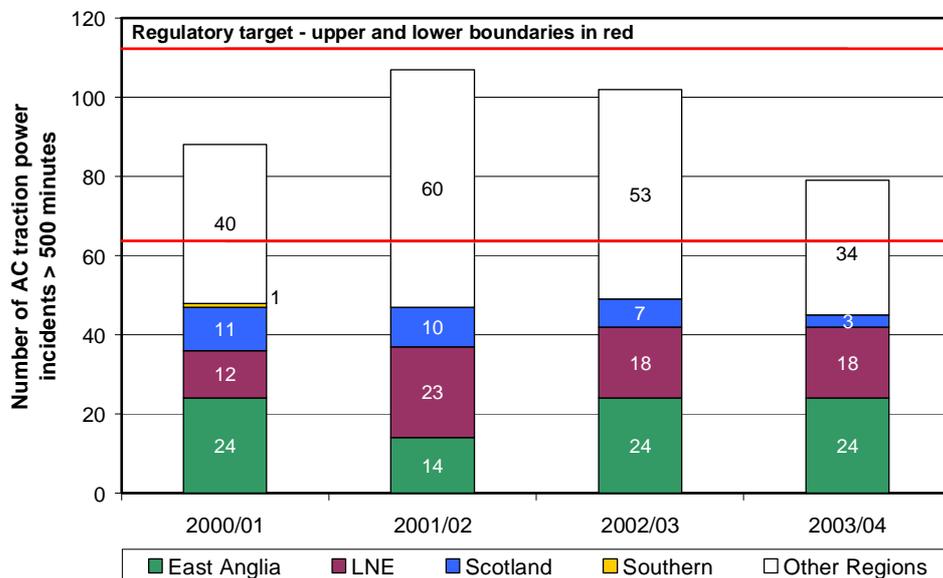


Figure 5.8.1 AC traction power incidents

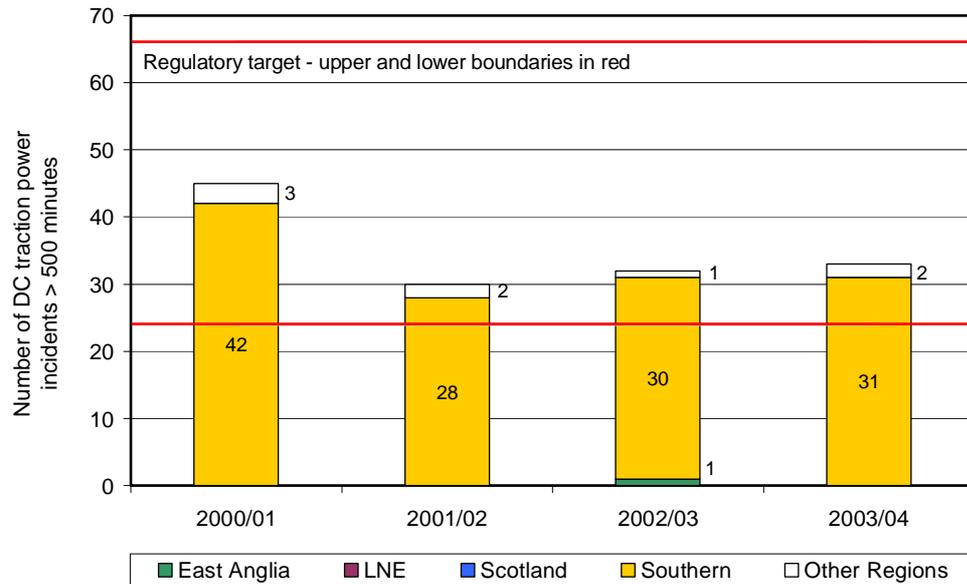


Figure 5.8.1 DC traction power incidents

5.8.7 The reported figures show little change from last year. The exception is M11 in Scotland Region, where the number of incidents decreased from 7 to 3, forming a declining trend for this measure. The other Regions we have audited report a change of only ± 1 incident when compared with last year's figure.

Findings

Asset Reporting Manual

5.8.8 During the 2003/04 year, responsibility for management of the reporting process moved from the HQ engineering team to the HQ asset knowledge team; the Regions retain responsibility for verifying the reported measure. There were no other material changes to the procedure or definition.

Headquarters

5.8.9 The HQ asset knowledge team generates a list of reportable incidents from the national incident log which is then verified by the Regions. As this list is compiled by someone with limited knowledge of electrification assets it does not match the Regions' view of traction power incidents.

5.8.10 The Regions we audited used different sources of data to verify the number of delay minutes in the HQ list of reportable incidents. East Anglia and Southern Regions used the TRUST delay attribution system, whereas LNE and Scotland Regions sourced this data from incident logs.

5.8.11 This is an important distinction. TRUST is updated to reflect reactionary delays and the re-classification of delay codes until the data refresh process is complete ay day 42. The incident log only reflects daily minutes recorded by controllers at a single point in time. The numbers of minutes delay recorded in these two systems for a given incident are not necessarily consistent, especially for incidents that may last over more than one control shift. A consistent data source should be used to identify delays that exceed the 500 minute threshold.

East Anglia Region

- 5.8.12 The reported figure for 2003/04 for measure M11 was 24, the same as last year and 2000/01. Delays in 2001/02 were 14. There have not been enough incidents reported in this measure for any conclusions to be drawn about any trends.
- 5.8.13 East Anglia Region has only 52 kilometres of third rail. No delays were reported for measure M12 during the reporting year.
- 5.8.14 The data used by the Regional engineer to verify the number of reportable delay minutes is taken from daily and periodic performance reports, which are sourced from TRUST. The root cause of the incident is verified by the Regional engineer using data from TRUST, COMPASS (an electronic incident logging system) and his own knowledge.
- 5.8.15 We found that the Region complied with the procedure and definition for these measures and no material discrepancies were identified in the reported results.

London North Eastern Region

- 5.8.16 There were 18 failures recorded for measure M11 during the reporting year, the same number as last year. There have not been enough incidents reported in this measure for any conclusions to be drawn about any trends.
- 5.8.17 The data used by the Regional engineer to verify the root cause and number of reportable delay minutes for an incident is taken from COMPASS. Each period, the incidents exceeding the delay threshold is downloaded and filtered to identify incidents complying with the definitions of M11 and M12.
- 5.8.18 Where there is doubt about the cause of an incident, particularly where it may be attributable to a problem with a train's pantograph, the Region employs external consultants to undertake an independent investigation and update COMPASS as appropriate.
- 5.8.19 We found that the Region complied with the procedure and definition for these measures and no material discrepancies were identified in the reported results.

Scotland Region

- 5.8.20 Scotland Region has reported a reduction in measure M11 falling from 7 incidents last year to 3 this year. This year's figure is lower than that reported in 2000/01 and 2001/02. There have not been enough incidents reported in this measure for any conclusions to be drawn about any trends.
- 5.8.21 The delay minutes in Scotland used to verify the HQ reportable incident list are sourced from the daily control log, which is not updated to reflect any changes to the delay minutes for an incident recorded in TRUST.
- 5.8.22 We found that the Region complied with the procedure and definition for this measure and no material discrepancies were identified in the reported results.

Southern Region

- 5.8.23 Delays for measure M16 in Southern Region rose from 30 to 31 this year. There have not been enough incidents reported in this measure for any conclusions to be drawn about any trends.
- 5.8.24 Incidents caused by traction overhead line equipment are identified using the daily log. The number of daily minutes attributed to each incident is sourced from TRUST via the Regional performance team.
- 5.8.25 We found that the Region complied with the procedure and definition for these measures and no material discrepancies were identified in the reported results.

Confidence grade

- 5.8.26 Network Rail have given measure M11 a confidence grade of B2 in the Regions where there is a significant population of assets and a grade of BX for the Regions with a small population of electrification assets. For measure M12, Network Rail has assigned a grade of B2.
- 5.8.27 To award a measure an accuracy band of 2 the reported figure must be within $\pm 5\%$. As there are such few incidents recorded for measure M11 an error of just one incident would exceed this accuracy band in some Regions.
- 5.8.28 In light of this and the inconsistent sourcing of delay minutes data we believe that the maximum accuracy score that can be achieved this year in is 3. We have therefore given the Regions we have audited B3, except BX for the Regions with a small population of electrification assets.

Recommendations

- 5.8.29 We recommend that the M11 and M12 procedures be changed so that TRUST is used as the single data source for determining whether an incident exceeds the delay threshold.
- 5.8.30 Generation of the reportable incident list by the HQ asset knowledge team appears to add little value to the M11 and M12 process, as this team does not have specialist electrification knowledge to identify root causation and the delay data used is not taken from the most accurate source. We recommend that the procedure be altered so that the data is generated Regionally from TRUST.

5.9 AC and DC electrification condition (M13 & M14)

Scope of audit

- 5.9.1 Audits of the Annual Return 2003/04 data and processes for these measures were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions.
- 5.9.2 M13 is a measure of the condition of AC traction feeder stations and track sectioning points. M14 is a measure of the condition of the DC substations. In both measures the condition of each asset is based on a 1-5 grading system with 1 representing the best condition.

Annual Return 2003/04 results

Regulatory target

- 5.9.3 No regulatory targets have been set for these measures. Targets will be established once a sufficient sample of the underlying population has been sampled. The target is for all assets to be assessed by the end of 2005/06.
- 5.9.4 As a high proportion of the assets on the network have now been inspected a regulatory target should now be established for these measures. Care should be taken when setting the regulatory target to ensure that it reflects an appropriate asset management strategy.
- 5.9.5 The cumulative inspection targets to be achieved by the end of 2003/04 are:
- (a) M13: 75% of AC feeder stations; 70% of AC track sectioning points.
 - (b) M14: 75% of DC substations.
- 5.9.6 Network Rail successfully achieved the cumulative inspection targets for both measures.

National results

- 5.9.7 Scores for these measures are presented as the average condition of all assets inspected since 2000/01. Figure 5.9.1 shows the average condition score for both M13 and M14 in this year's Annual Return is 1.9 which is an improvement on previous years.

Measure	2000/01	2000/01-2001/02	2000/01-2001/02	2000/01-2001/02
M13	2.1	2.1	1.9	1.9
M14	2.2	2.3	2.1	1.9

Figure 5.9.1 AC and DC electrification condition

- 5.9.8 For both measures there has been a significant increase in the percentage of assets categorised as condition grade 1 since 2000/01; from 17% to 28% for M13 and from 14% to 31% for M14. This has been partly offset by a reduction in the percentage of assets in condition grade 3; from 23% to 16% for M13 and from 30% to 18% for M14. The percentage falling within condition grade 2 has stayed relatively constant.
- 5.9.9 Figures 5.9.2 and 5.9.3 summarise the reported figures for measures M13 and M14 since 2000/01 respectively.

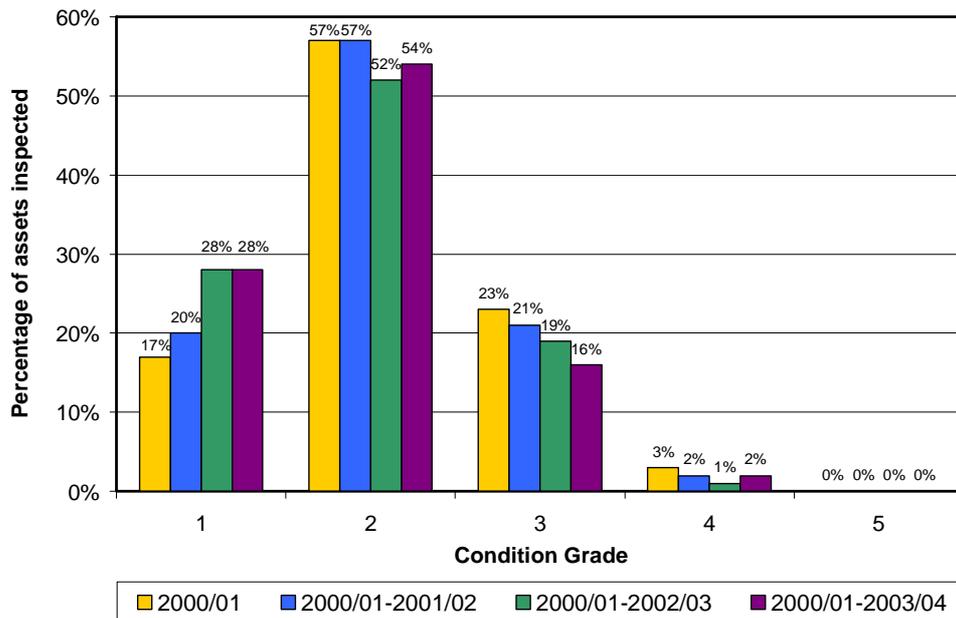


Figure 5.9.2 AC electrification condition

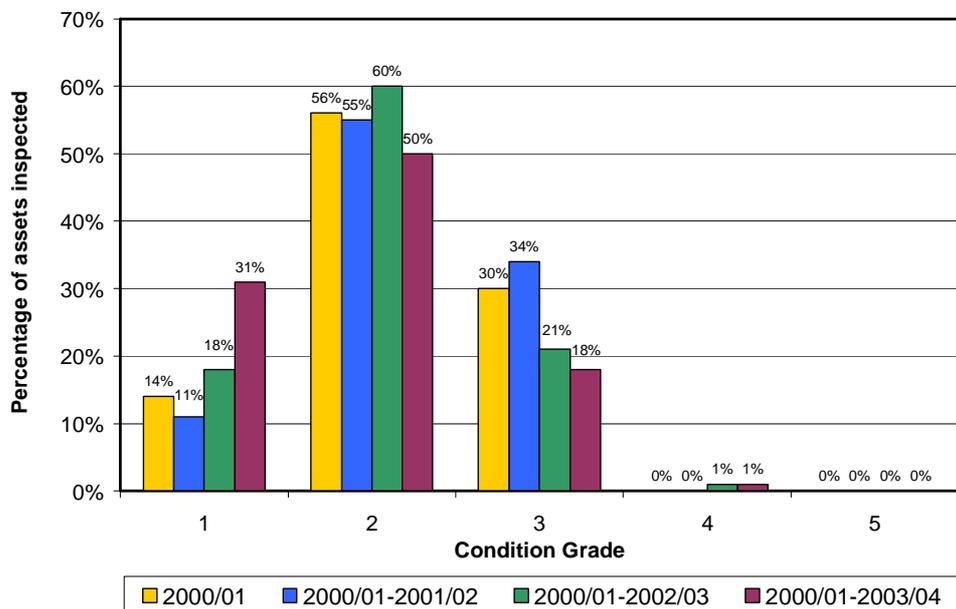


Figure 5.9.3 DC electrification condition

5.9.10 We have identified two likely explanations for this improvement during the audit:

- (a) A more pro-active maintenance regime has been introduced by Network Rail
- (b) The assets in worst condition were assessed in the early years of the sampling programme. As the programme is nearing completion, the inclusion of assets in better condition has led to the average score improving.

Regional results

5.9.11 The number of assessments undertaken for each measure is shown in Figure 5.9.4.

	East Anglia	LNE	Scotland	Southern	Network Total
M13					
AC Feeder Stations (75% target)					
Population (number)	20	24	10	0	83
Target (number)	15	18	8	0	64
Achieved (number)	16	17	8	0	66
Achieved (percentage)	80%	71%	80%	n/a	80%
AC Track Sectioning Points (70% target)					
Population (number)	52	46	29	0	210
Target (number)	37	33	21	0	150
Achieved (number)	35	26	20	0	148
Achieved (percentage)	67%	56%	69%	n/a	70%
M14					
DC Substations (75% target)					
Population (number)	8	5	0	361	418
Target (number)	6	4	0	271	315
Achieved (number)	4	2	0	283	325
Achieved (percentage)	50%	40%	n/a	78%	78%

Figure 5.9.4 Progress for electrification condition inspections

5.9.12 While the national targets have been achieved for all measures, the number of track sectioning points inspected within the Regions we have audited was below the Regional target. The number of feeder stations assessed on LNE Region was also below the target of 75%.

5.9.13 The number of substations assessed in East Anglia and LNE Regions was also below the national target however these represent a very small proportion of total substations.

Findings

Asset Reporting Manual

5.9.14 We note that no changes have been made to the procedures and definitions for these measures M13 and M14 as a result of our recommendations in last year's audit report, and in particular the following recommendations.

- Track paralleling huts should be included in the condition measure as they are an integral part of the power supply system. We note Network Rail's view that this is not practical during the Southern power supply upgrade however we believe that the measure should be adjusted to include these assets as soon as possible.
- A separate measure should be introduced for high voltage cable systems as these are an important part of the power supply system.
- Greater use should be made of the results of condition monitoring tests and other information available in the Regions.

5.9.15 For measure M13, Network Rail HQ issued a set of guidelines for the condition assessment forms this year, in order to improve consistency across the Regions. We welcome this development.

- 5.9.16 We note that the guidelines issued for M13 have been a benefit to the Regional teams as they have introduced more clarity to the process; however we are concerned that in response to these guidelines, the inspections appear to be less intrusive and more visual than previously. Examination of maintenance records as part of these inspections also appears to have ceased.
- 5.9.17 The condition assessment process was found to be consistent with the definition and procedures for these measures, including use of the condition assessment forms.

Headquarters

- 5.9.18 The Regions undertake the condition assessments which are then sent to HQ and manually entered into a master spreadsheet. Where assets have yet to be inspected they are allocated a score based on the average condition grade for assets of that type. No work has been done to verify whether, for past years, the scores assigned to missing assets has matched the scores allocated to them.
- 5.9.19 During the HQ audit, we found several errors in the spreadsheet used to calculate the average condition score for M14. These were corrected prior to publication of the Annual Return and have therefore not impacted on the figures reported.
- 5.9.20 The HQ champion for these measures was appointed during the reporting year. The champion undertook a series of site visits in LNE and Scotland Region to gain an appreciation of the assessment process as implemented.

East Anglia Region

- 5.9.21 The average condition grades in East Anglia Region are 2.11 for measure M13 and 2.25 for measure M14. The grade for measure M14 is based on just six condition assessments out of a total of 8 DC substations.
- 5.9.22 There are a relatively small number of assets in the Region – 20 AC feeder stations, 52 AC traction sectioning points and 8 DC substations; we found the engineers on the Region tended to have a good knowledge of their condition.
- 5.9.23 The inspection process this year was undertaken by three new team members; to ensure effective handover and year-on-year consistency, the previous year's inspectors also attended these inspections.
- 5.9.24 Even though there is no other formal condition assessment process in the Region, the M13 and M14 condition measures are not used in the development of the Region's renewals plan.
- 5.9.25 As the Region has a relatively small number of assets with a relatively low age profile (all are within their first lifecycle), we would expect the condition of the assets to deteriorate over time, even when properly maintained. This should be taken into consideration when setting a regulatory target for M13 and M14.
- 5.9.26 We found no material discrepancies with the assessment results reported to HQ were found during the audit.

London North Eastern Region

- 5.9.27 LNE has a low average score of 1.67 for measure M13, reflecting the fact that the equipment is in good condition. We found that considerable investment in distribution equipment had been undertaken in the Region, including installation of dehumidifiers.
- 5.9.28 The average score for measure M14 is 2.40; however this is based on just 2 inspections out of a total of 5 DC substations.
- 5.9.29 LNE Region failed to achieve its assessment targets for M13 and M14, although the shortfall primarily relates to the low number of traction sectioning point inspections undertaken in previous years.
- 5.9.30 We found no material discrepancies with the assessment results reported to HQ were found during the audit.

Scotland Region

- 5.9.31 The average condition grade for measure M14 is 1.83 in Southern Region. The Region has no DC substations therefore there is no score for measure M14.
- 5.9.32 We note that the inspection programme for assets in Scotland Region was developed to ensure the assets in worst condition were inspected at the start of the programme in 2000/01. We expect that as the sample size approaches 100% of assets, the condition of the assets assessed will improve and the average score will fall.
- 5.9.33 Two inspectors undertook the M13 condition assessments for this year; to improve consistency between condition assessments the inspectors undertook cross checks of each others' assessments.
- 5.9.34 We found no material discrepancies with the assessment results reported to HQ were found during the audit.

Southern Region

- 5.9.35 The average condition grade for measure M14 is 1.83 in Southern Region. This is very close to the national average score of 1.86 as 86% of DC substations are within the Region. Southern Region has no assets which fall within measure M13.
- 5.9.36 Southern Region completed 103 condition assessments during the year, exceeding the 75% target. To maximise productivity, the inspectors also undertake surveillance checks at the same time at the assessments.
- 5.9.37 The Region undertakes no formal quality assurance processes but we found evidence of ad hoc checking of the assessments. The Region reported that on occasion two inspectors assess the same asset and the scores compared to develop an indicator of consistency.
- 5.9.38 We found that the M14 condition measure is not used in the development of renewals plans. Substation renewals are undertaken on a part-by-part basis rather than by whole asset replacement. M14 provides an average score for each substation; it does not provide a detailed assessment of the condition of each element of plant.
- 5.9.39 We found no material discrepancies with the assessment results reported to HQ were found during the audit.

Confidence grade

- 5.9.40 Network Rail has assigned measures M13 and M14 a confidence grade of B3. As the assessment process is inevitably somewhat subjective we believe that this is an appropriate grade. We have provided a BX grade for those Regions with no assets.

Recommendations

- 5.9.41 We note last year's recommendations have not been implemented. We reiterate the key recommendations for M13 and M14 condition assessments below:
- (a) Investigation should take place into the inclusion of plant condition assessments within the Annual Return.
 - (b) Assessments should be extended to include all of the asset, cables and switches.
 - (c) Track paralleling huts should be included in the condition measure.
 - (d) A separate measure should be introduced for high voltage cable systems.
 - (e) The substation scoring system should be reviewed and simplified.
 - (f) Assessments should take account of loading.
 - (g) Greater use should be made of the results of condition monitoring tests and other information available in the Regions.
 - (h) The condition of the building fabric should be subject to a separate measurement process so that equipment issues are not hidden.

- 5.9.42 In addition we wish to make the further recommendations below, as a result of this year's audits:
- (a) We recommend the programme of HQ audits should be extended to cover all Regions for both M13 and M14 measures.
 - (b) We recommend that the Regions should provide separate commentaries to HQ for M13 and M14, similar to other measures in the Asset Reporting Manual. We would expect the Annual Return to contain reference to specific areas of concern at a Regional level, which requires direct input from the Regional engineers responsible for the assets.

5.10 AC & DC traction contact system condition (M15 & M16)

Scope of audit

- 5.10.1 The scope of this audit was to verify the accuracy of data and commentary reported in Network Rail's Annual Return 2003/04, Section 2, Electrification condition – AC traction contact systems (M15) and Electrification condition – DC traction contact systems (M16). The definitions for these measures are documented in RT/ARM/M15DF and RT/ARM/M16DF and the procedures documented in RT/ARM/M15PR and RT/ARM/M16PR. Audits were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions during May and June 2004.
- 5.10.2 Measure M15 reports the condition of the AC contact systems on a scale of 1 to 5 based on physical wear and visual inspection of key components, where a condition grade of 1 is good. The measure excludes earthing, bonding and traction return circuits.
- 5.10.3 Measure M16 is a measure of the condition of DC contact systems, also on a scale of 1 to 5, based on physical wear measurements of conductor rail. The measure excludes any associated equipment. Wear measurements are allocated to the condition bands using the following criteria, based on a maximum allowable wear of 33%.
- (a) Band 1 – 0% to 25%
 - (b) Band 2 – 25% to 50%
 - (c) Band 3 – 50% to 75%
 - (d) Band 4 – 75% to 100%
 - (e) Band 5 – Above 100%

Annual Return 2003/04 results

Regulatory target

- 5.10.4 No regulatory targets have been set for these measures. Targets will be established once a sufficient sample of the underlying population has been sampled.
- 5.10.5 For M15, 20% of the entire population of AC contact systems should be inspected by 2005/06. The Annual Return commentary states that the tension lengths are carefully selected to be representative of the whole network.
- 5.10.6 For M16, the entire asset population is to be inspected at least once in the previous 10 years by 2005/06.

National performance

- 5.10.7 The condition of AC contact systems reported for measure M15 has improved this year from average score of 1.8 to 1.7. This is a further improvement over the score of 1.9 recorded in 2000/01.
- 5.10.8 Figure 5.10.1 shows an increase in grade 1 assets over the last three years, and a decrease in the number of grade 2 and grade 4 assets.

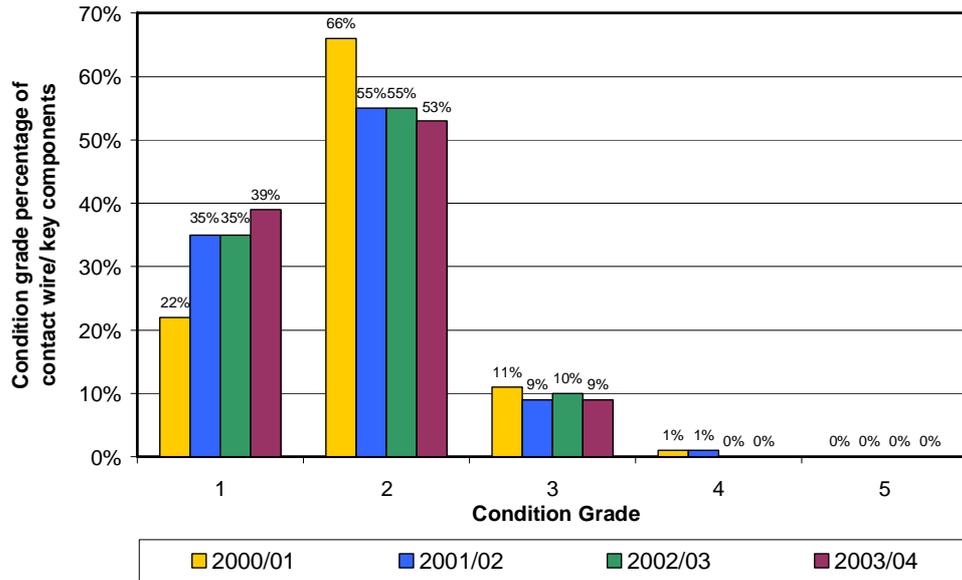


Figure 5.10.1 AC traction contact system condition

- 5.10.9 The condition of DC contact systems reported for measure M16 has remained constant since 2000/01 at 1.8.
- 5.10.10 This is not surprising as only 16% of conductor rail wear measurements included within the measure have been undertaken since 2000. A large proportion of the information reported for this measure is therefore based upon old wear measurements, extrapolated to reflect an estimate of current wear.
- 5.10.11 Figure 5.10.2 shows the age profile of the wear measurements on Southern Region.

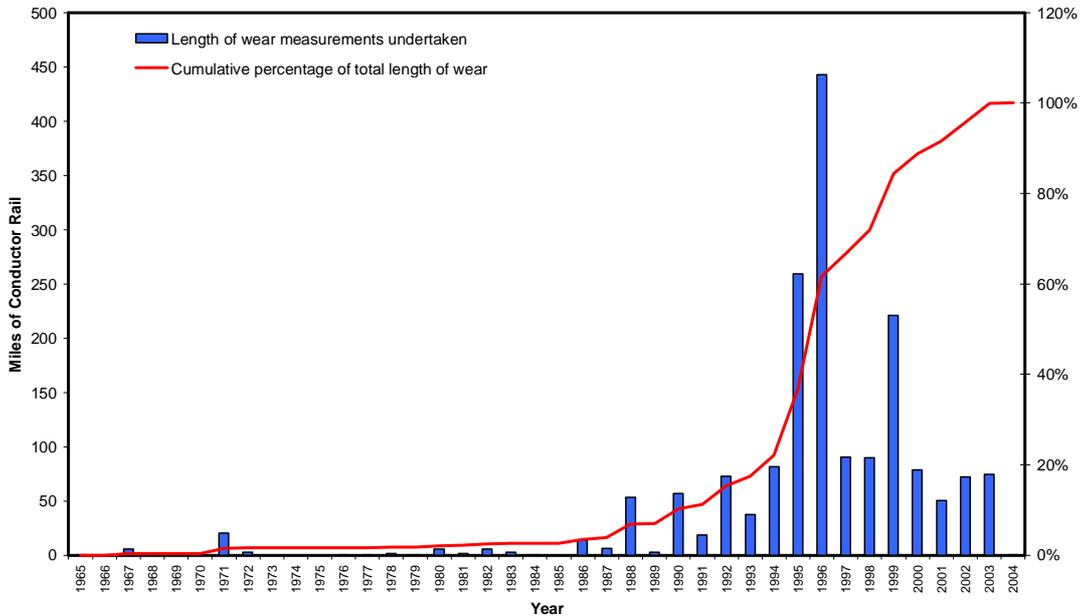


Figure 5.10.2 Age profile of wear measurements on Southern Region

- 5.10.12 22% of wear measurements included within the reported measure are more than 10 years old and some date back to the mid-1960s. The assumptions regarding likely wear rates for these assets are therefore critical when extrapolating to provide the results reported in the Annual Return.
- 5.10.13 Within the spreadsheet used to extrapolate the wear rates the following assumptions are made. The source of these wear rates is not clear, however, we believe that they have been used for a number of years.

Rail Type	% wear per annum	Implied Asset Life
Steel 100 lb	0.27%	123
Steel 106	0.25%	131
Steel 150	0.31%	107
Steel 150W	0.24%	137
Aluminium	0.97%	33

Figure 5.10.3 Data for extrapolating DC contact system wear measurements

- 5.10.14 We note that, while the extrapolated wear rates reported may accurately reflect the average rate of wear across the asset population, the actual wear can vary greatly from location to location, based on:
- (a) Traffic density and frequency.
 - (b) Weather conditions.
 - (c) The extent of arcing, which causes electrical erosion.
- 5.10.15 The sample used for this measure is currently 64% of the total population of conductor rail, the vast majority of which is in Southern Region, and includes the 22% of wear measurements that are more than 10 years old. There is a long way to go to meet the aim of having measurements for all conductor rail taken in the last 10 years by 2005/06.

Regional performance

- 5.10.16 M15 average condition grades vary for the Regions we have audited, ranging from 1.4 for LNE to 1.8 for East Anglia.
- 5.10.17 Figure 5.9.4 shows the East Anglia's lower score is caused by a high proportion (66%) of assets with condition grade 2 and a condition grade of 3 (8%); however, the average score for the Region (1.8) is only slightly worse than the network wide average (1.7).

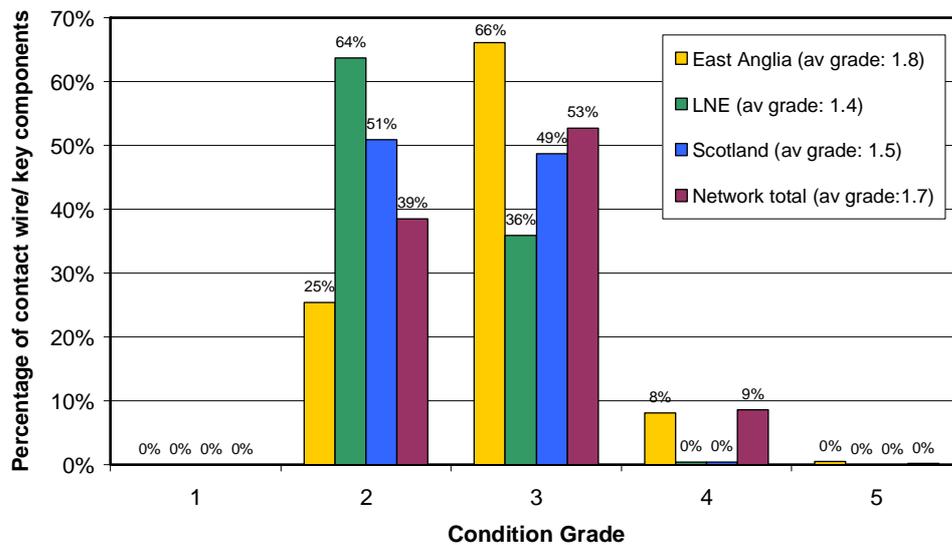


Figure 5.10.4 AC traction contact system condition

Findings

Asset Reporting Manual

- 5.10.18 We are pleased to note that Network Rail held internal meetings during 2003 to discuss our 2002 audit findings for measures M15 and M16; unfortunately the agreed actions from these meetings have yet to be incorporated into the definition and procedure.
- 5.10.19 A sub-procedure for measure M16 was issued in March 2004 (Network Rail/ARM/M16SP1) describing the process for updating the assessment spreadsheet with conductor rail measurements. We found that Southern Region were not aware of this document but our investigations suggest that the process implemented in the Region was not materially different that described in the sub-procedure. This has not affected the figures reported.
- 5.10.20 The selection of tension lengths for measure M15 is driven by Network Rail HQ who seek to ensure that the selection of length assessed is representative of the network as a whole.

Headquarters

- 5.10.21 The procedures for M15 and M16 require the HQ electrification & plant engineering team to initiate a national audit process to ensure consistency and adherence to process guidelines, including independent checks on a random sample of assessments. Only one Region was audited for M15 during the 2003/04 year, though we found a plan had been developed to audit all Regions within the year.
- 5.10.22 No audits were undertaken for M16; we were informed that as this was “a simple gauging measure” there was no need to have the same level of audit as for M15. The procedure for M16 does however state that an internal audit process should be instigated.

East Anglia Region

- 5.10.23 East Anglia Region failed to reach the target number of assessments for M15, reporting 65 assessments against a target of 71; we found that this was partly due to resource constraints caused by a 50% vacancy rate in the electrification department. Otherwise we found that the Region complied with the procedure and definition for this measure and no material discrepancies were identified in the reported results.
- 5.10.24 The Region undertakes 4 weekly patrols of the overhead line equipment and other, less frequent, inspections in addition to the inspections for M15. We found that M15 compared poorly as a measure of asset condition with the other inspections undertaken: the measure requires mid-span measurements of condition whilst the worst wear areas are on registration points which are excluded from the measure. The M15 inspections are not utilised in the planning of renewals workbanks.
- 5.10.25 We found M16 inspections have not yet been undertaken on the 52 kilometres of third rail track in the Region; the M16 results reported currently do not include results from East Anglia Region.

London North Eastern Region

- 5.10.26 During the reporting year, the Region undertook 61 inspections for measure M15 against a target of 62. We found that the Region complied with the procedure and definition for these measures and no material discrepancies were identified in the reported results.
- 5.10.27 Similar to East Anglia Region, we found M16 inspections have not yet been undertaken on the Region's 8 kilometres of third rail track between Drayton Park and Moorgate; the M16 results reported currently do not include results from LNE Region

Scotland Region

- 5.10.28 We found Scotland undertook only 31 assessments compared with a target of 64. We also found the Region was not compliant with standard RT/O/P/015 on the inspection of plant, even though the Region bundled the M15 inspections with OHL surveillance and end-product checks of contractor's work.

- 5.10.29 Similar to East Anglia, this was due to resource constraints; at the time of the audit there were several vacancies within the electrification department and only one inspector for this measure. A graduate assistant has been recruited to undertake some of the assessments in the coming year. .
- 5.10.30 The asset profile in Scotland is different to the other Regions as many of the assets are relatively new; this is reflected in the good average condition score for the Region.
- 5.10.31 Apart from missing the inspection target, we found that the Region complied with the procedure and definition for these measures and no material discrepancies were identified in the reported results. .

Southern Region

- 5.10.32 Southern Region has measurements for 77% of the third rail within the Region. However, as discussed above, these measurements have an extended age profile; 22% of measurements are more than 10 years old. Estimates of current wear levels are calculated by extrapolating wear, based on average wear rates.
- 5.10.33 For 2003/04, wear measurements were undertaken by Network Rail's infrastructure maintenance contractors; however, only one of the three areas in the Region (Kent) provided wear measurements. Just 4% of the third rail within the Region was measured against a target of 10%. The resources allocated to undertake these measurements were redirected by Network Rail due to the low priority of wear measurement.
- 5.10.34 The Region plans to undertake a one-off 2-year third rail gauging exercise to cover 90% of the third rail in the Region. This would deliver a step-change in data quality for this measure and significantly improve Network Rail's knowledge of asset condition. At the time of the audit, Network Rail's business plan included a £4 million provision for this work. Network Rail are currently investigating a train-borne gauging solution, which would provide positional gauge measurements as well as the wear measurement.
- 5.10.35 Wear measurements are used by the Region to plan renewals. A site survey is normally undertaken prior to its inclusion in the renewal workbank. These surveys have identified that the reliability of wear measurements has been improving, assisted by a tool developed by Network Rail to identify the type of conductor rail being measured. This is important as the rail type affects the wear calculation.
- 5.10.36 The average life of a steel conductor rail is currently estimated by the Region at 80 to 90 years, which means around 50 kilometres a year should be replaced on the Region. We found that last year only 10 kilometres were replaced and a bow wave of renewals is building up.
- 5.10.37 This bow wave is not reflected in the M16 wear measurement score. As measurements can be included in the measure for up to 10 years, the measure is not sensitive enough to pick up such changes.

Confidence grade

- 5.10.38 Network Rail have graded measures M15 and M16 as confidence grade B3.
- 5.10.39 Measure M15 is based upon a very small sample of tension lengths (15% of the total asset population). These are chosen by Network Rail HQ to accurately reflect the asset population across the network. Given such a small sample is used in this measure we have graded it at C3.
- 5.10.40 Measure M16 uses a high proportion of old data, some from the mid-1960s, to extrapolate current wear levels. There has also been a significant shortfall in wear measurements undertaken by maintenance contractors this year. We have therefore graded this measure at grade C3.

Recommendations

- 5.10.41 We believe a target of B3 should be achievable for measures M15 and M16. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.

- 5.10.42 Measure M15 requires a significant amount of resource to implement yet is of no practical benefit to Network Rail. This is of concern as a recurring issue raised in the audits was a shortage of electrification engineers leading to vacancies in the Regions. We recommend that Network Rail's current inspection processes should be compared with the regulatory inspection processes for M15, with a view to eliminating separate regulatory inspections and calculating the M15 measure from day-to-day inspections.
- 5.10.43 We fully support Southern Regions' proposal to undertake a one-off exercise to establish wear measurements for the majority of its third rail (M16), as this will bring significant benefits from better understanding the condition of its assets and improve the accuracy of the data reported for M16. We recommend that either (a) this proposal is implemented or (b) there is a significant increase in the size of the sample inspected each year.

5.11 Station condition index (M17)

Scope of audit

- 5.11.1 The audit consisted of a review of processes and sample data held at HQ with the HQ Champion and in each Region with the process owner. These discussed any changes which had occurred to the inspection and data collection processes for the 2004 Return, the number of inspections carried out, the extent of Regional and HQ checking and auditing, programme, and any suggestions for improving the measure in the future.
- 5.11.2 This measure assesses Network Rail's stewardship of stations; the condition of assets at the station are scored during visual inspections by comparing their asset life remaining with benchmark asset lives and combined into an overall condition score for the station.

Annual Return 2003/04 results

Regulatory target

- 5.11.3 The regulatory target for the station condition index is to maintain the average condition grade at 2.2.

Results

- 5.11.4 The national average condition grade reported for the complete portfolio is 2.25; the average score for the stations assessed this year is 2.29.
- 5.11.5 The number of stations achieving grades 1-5 across the entire network in the last 4 years is shown in figure 5.11.1. Grade 2 represents 72% of the inspected population; grades 1-3 represent 99.6% of the inspected population.

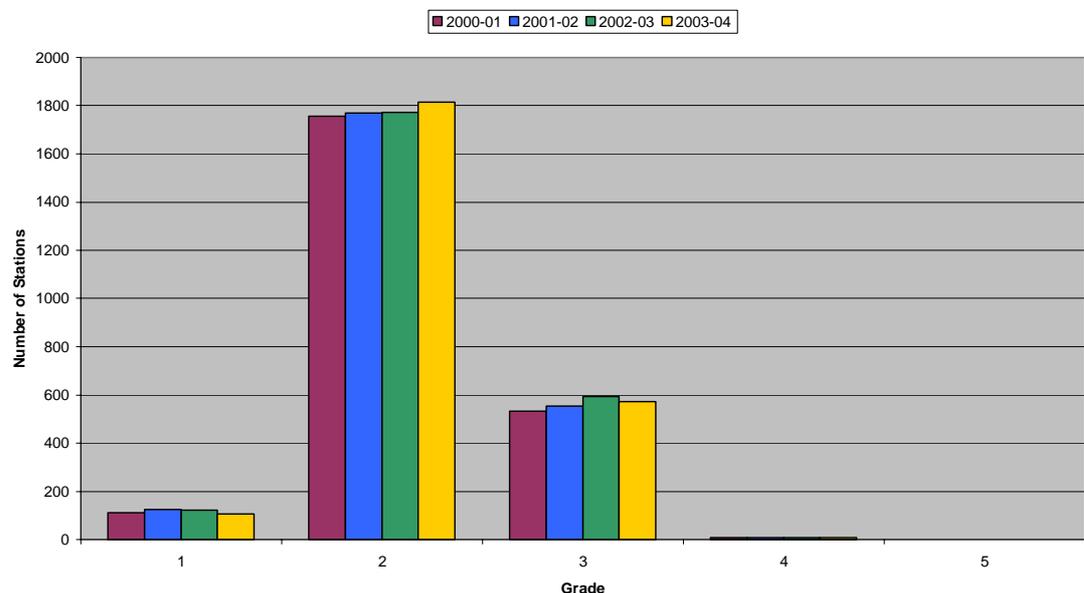


Figure 5.11.1 Station condition

- 5.11.6 The dominance of grades 1-3 is due to the non-linear nature of the grade bands. Figure 5.11.2 shows how the gaps between the grades are 25% (grade 1-2), 30% (grade 2-3), 30% (grade 3-4), 15% (grade 4-5) of residual life, ie grades 1-3 cover 85% of the possible range of condition, whilst grade 4 covers just 15% of the possible condition range. We have found no reason why the grades are not linear, with equal gaps between the grades.

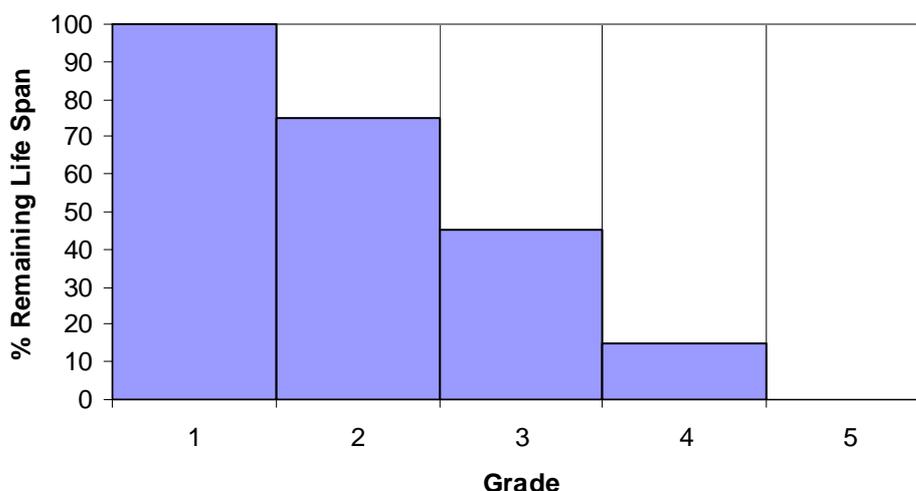


Figure 5.11.2 Relative sizes of M17 condition grades

- 5.11.7 It is improbable that Grade 5 will ever be used, as the grade for a station is derived from the asset condition of 34 different types of station asset. In order for a station to score a grade 5, virtually all of its assets would have to be life expired, which is highly unlikely. It would be more useful if grade 5 was expanded to cover a range of asset life so that it becomes a useful part of the measure.
- 5.11.8 The scores for each of the 34 asset types are not weighed to reflect their relative importance to customers or differing levels of maintenance and renewal expenditures.
- 5.11.9 The benchmark asset lives for the measure are taken from the Component Life Manual published by Housing Association Property Mutual (HAPM) with additions specific to the railway environment. This data is based on 'insured service lives'; HAPM advise that expected asset lives are about 5% greater. This will have the effect of understating the measure.
- 5.11.10 As we suggested in our previous two reports, this measure should be changed to make it more discerning for regulatory purposes. Key issues for this scoring system are:
- The grading system should be linear, with each band representing a 20% decrease in residual life.
 - Each asset type should have an individual weighting that reflects (1) Some assets are more important than others to customers (2) The condition of each particular asset type is also of differing importance to customers, and (3) The variation in levels of expenditure necessary to maintain or renew these assets.
 - The benchmark asset lives used for this measure should be reviewed.
- 5.11.11 Given these unresolved misgivings, we have not sought to undertake a detailed site audit of asset inspections made under this measure.

Findings

Process

- 5.11.12 No material changes have been made to the definition and procedures for this measure since last year; however, responsibility for the process has transferred from Network Rail's Operational Property Engineering group to its Railway Estate directorate.
- 5.11.13 For the second year running, plans to collect inspection data by handheld computer have not been implemented; however, trials of this system are now being undertaken.

5.11.14 We found no evidence of Regional personnel using this measure in the management of maintenance or renewals workbanks or budgets.

Headquarters

5.11.15 For the second year running, headquarters personnel failed to undertake an audit of the data collected, as required by the procedure.

5.11.16 We found a few minor discrepancies for survey dates within the reporting database but these have had no material effect on the data reported in the Annual Return.

East Anglia Region

5.11.17 Figure 5.11.3 shows the inspection dates for the complete station population on the Region. The Region has been inspecting around 20% of the population per annum for the last three years; if perpetuated, this level of activity will ensure the entire population is assessed within the third control period, in compliance with the procedure.

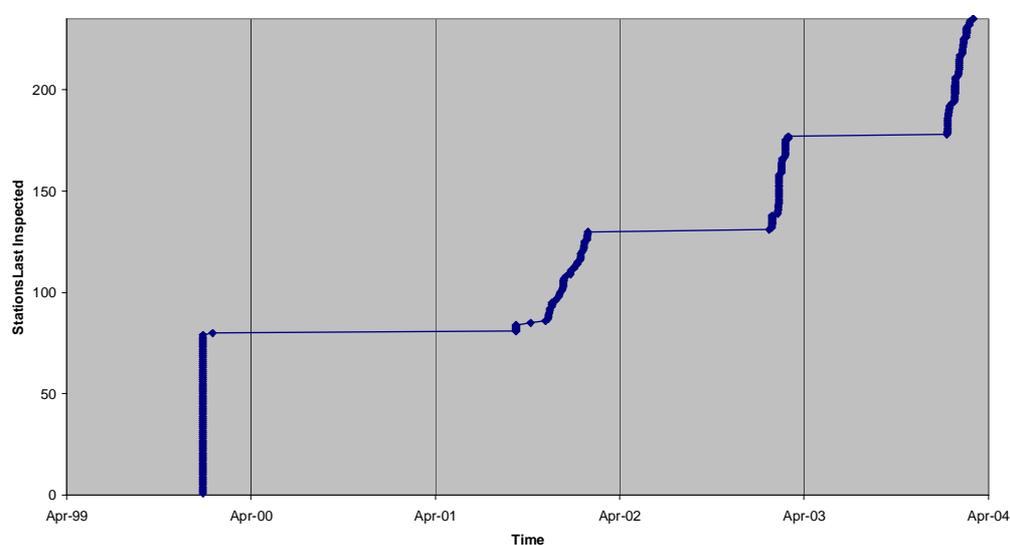


Figure 5.11.3 Station inspection dates for East Anglia Region

5.11.18 We found the condition grades achieved for eight stations had been revised as they were just below a target score set by the HQ champion. The changes made to these inspections were mainly corrections but also incorporated work in progress and an asset which was present but not in use. Whilst these changes had a negligible effect on the overall score, the selective checking of stations scoring just below a target level is clearly unacceptable.

London North Eastern Region

5.11.19 Figure 5.11.4 shows the inspection dates for the complete station population on the Region. The quantum of inspection activities per annum is not consistent over the programme, as described in the procedure; however, the programme was largely completed one year in advance of the target.

5.11.20 We found a worrying lack of ownership of the reported results within the Region; we believe this was due to the perception within the Region that the measure was not relevant to the renewals process and the condition grade was based largely on decorative appearance rather than the state of the underlying fabric.

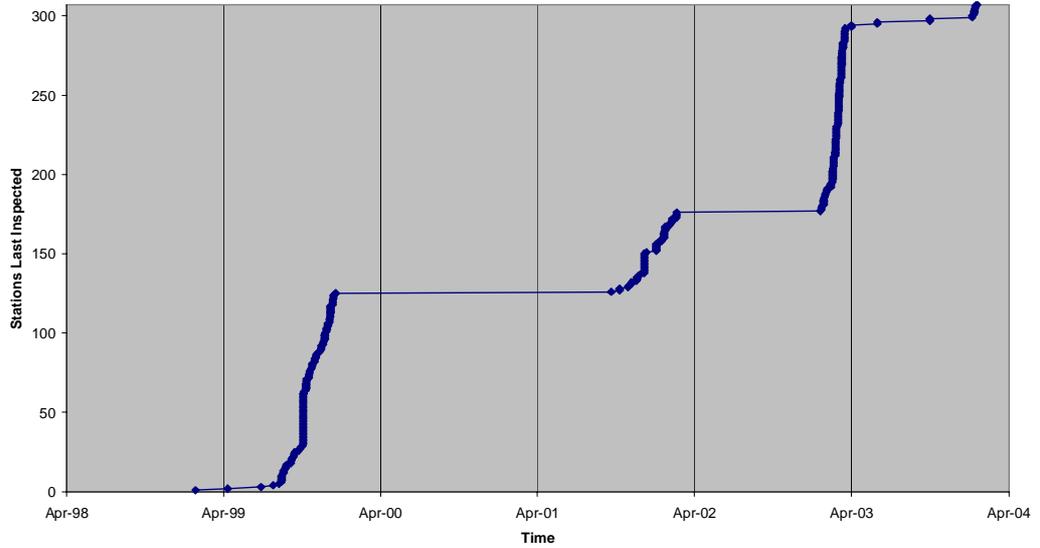


Figure 5.11.4 Station inspection dates for LNE Region

Scotland Region

- 5.11.21 Figure 5.11.5 shows the inspection dates for the complete station population on the Region. The inspection programme for the last two years appears to have reached a level of activity in compliance with the procedure, though we note the inspections are skewed towards year end.
- 5.11.22 Scotland is the only Region to have carried out an audit of the inspection data using a 20% sample of inspection reports; the procedure requires all forms to be checked by the Regional process owner but does not require a Regional audit.

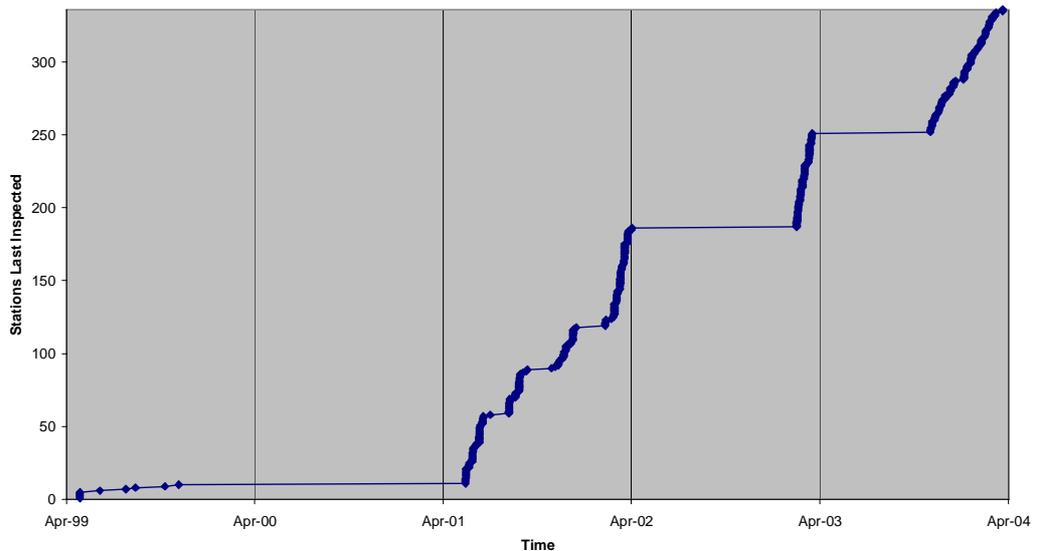


Figure 5.11.5 Station inspection dates for Scotland Region

Southern Region

5.11.23 Figure 5.11.6 shows the inspection dates for the complete station population on the Region. Approximately 10% of the stations were inspected prior to the third control period. The inspection programme has not yet stabilised.

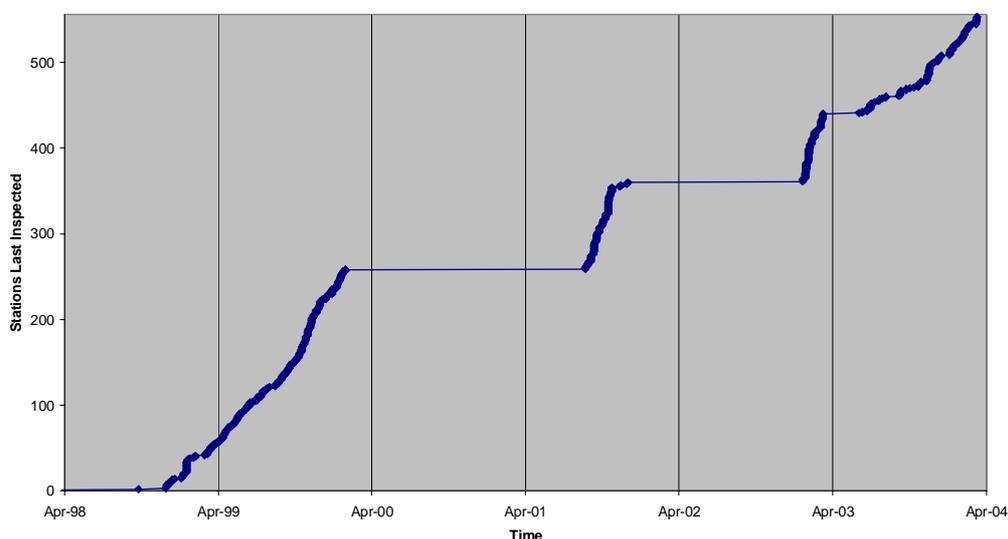


Figure 5.11.6 Station inspection dates for Southern Region

Confidence grade

- 5.11.24 Network Rail has suggested a confidence grade for this measure of B2.
- 5.11.25 The measure is documented and an audit trail is retained; however, the subjective nature of this measure warrants against a reliability grade of A. We believe this merits a B grade.
- 5.11.26 An accuracy grade of 2 is equivalent into to an accuracy of $\pm 5\%$, which for the current score of 2.25 equates to an accuracy of ± 0.1125 . There is also a reported ± 0.1 tolerance for this measure. The inspection process for each asset is subjective, but averaged for a station and then averaged across the network to create a relatively insensitive measure. We accept Network Rail's assessment of accuracy grade 2.
- 5.11.27 We have given this measure a confidence grade of B2. However, we would note that this does not reflect the value of this measure as a true score of station condition.

Recommendations

- 5.11.28 The grading system for M17 should be revised so that it is linear, with each band representing a 20% decrease in residual life.
- 5.11.29 The current inspection methodology for M17 should be retained but revised weightings should be developed for each asset type. This would enable the historic inspection data to be restated using the new weightings, so maintaining comparability between previous years and control periods. The weightings should consider (1) Some assets are more important than others to customers (2) The condition of each particular asset type is also of differing importance to customers, and (3) The variation in levels of expenditure necessary to maintain or renew these assets.
- 5.11.30 The M17 measure baseline is the HAPM 'insured service life'; expected asset lives are about 5% greater. This will have the effect of understating the measure. We recommend the benchmark asset lives used for M17 should be reviewed.

5.12 Station facility score (M18)

Scope of audit

- 5.12.1 The audit consisted of a review of processes and sample data held at HQ with the HQ Champion and in each Region with the process owner. These discussed any changes which had occurred to the inspection and data collection processes for the 2004 Return, the extent of Regional and HQ checking and auditing, programme, and any suggestions for improving the measure in the future.
- 5.12.2 The purpose of the Station Facilities Index is to monitor and report the level of facilities present at stations. The facilities are grouped into various themes, which are reported separately. A score is calculated by counting the number of specific items at each station. No weighting is applied to reflect the relative importance or large differences in the quantities of different types of facilities. The score is also expressed as an index measured against a level of 100 at 2000/2001.

Annual Return 2003/04 results

Regulatory target

- 5.12.3 No regulatory target has been set for this measure.

Results

- 5.12.4 The station facility score has risen steadily by a total of 4.8% over the last 3 years, representing an increase in counted assets from 173,447 to 181,778.
- 5.12.5 Figure 5.12.1 shows this increase is dominated by the safety & security theme, which also accounts for over 61% of the total score.

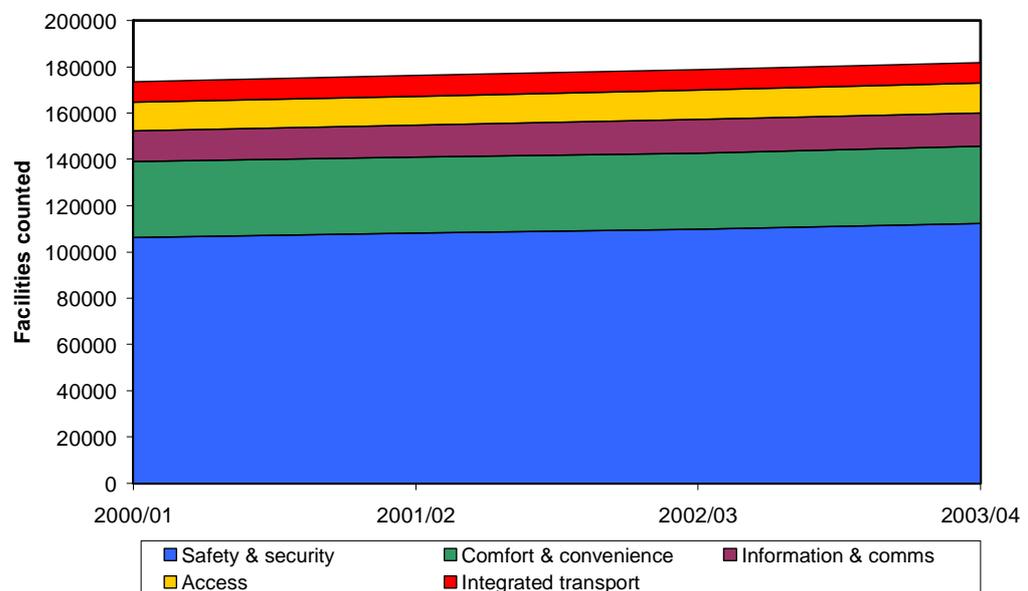


Figure 5.12.1 Station facility scores

- 5.12.6 There has been a 1.7% increase for the M18 measure this year dominated by a 3.7% increase for Category A stations and a 2.3% increase for Category C stations.

- 5.12.7 As reported in previous years, the scoring system is arbitrary in nature. The score comprises 67 different elements grouped into broad categories. Items counted on platforms have a dominant effect on the overall score; previous audits identified that the East Anglia facilities score was dominated by lamp-heads which accounted for 54% of the entire score even though the number of lamp-heads may not be proportional to the luminance level or coverage. We identified other situations where individual scores had a disproportionate effect on the total score.
- 5.12.8 As noted in previous years, the score focus entirely on quantity not quality – no account is taken of whether the facilities are functional and in use or not. The relevance of items counted towards the overall score is not assured casting doubt on the usefulness of the measure in both relative and absolute terms.
- 5.12.9 Given these unresolved misgivings, we have not sought to undertake a detailed site audit of asset inspections made under this measure.

Findings

Process

- 5.12.10 There were no material changes to the procedure or definition for this measure. The reporting frequency has been amended from 3 monthly to 6 monthly, but this has no impact on the score reported at year end.
- 5.12.11 Plans to collect M18 inspection data by handheld computer have not been accepted on all Regions. These plans may be combined with those for computerising M17 collection. However, this will deliver limited economies of scale as the user groups are different: in-house surveyors undertake M18 inspections whilst contractors undertake M17 inspections.

Headquarters

- 5.12.12 There has been a general shortage of personnel resources due to the management reorganisation and maternity leave at HQ, and below strength teams of building surveyors in some Regions.
- 5.12.13 The new HQ Champion has made significant improvements by briefing the Regions on the scoring system and providing transparency to the scores such that they now understand the basis of what they are signing off.
- 5.12.14 An audit of 20 stations was undertaken by the HQ champion. A report of the audit findings has been produced together with recommendations for the future management of the reporting process for the measure.

East Anglia Region

- 5.12.15 The Region undertook surveys at 14% of the stations compared with a target of 20%. The shortfall was caused by redundancies in the surveying team and additional workload associated with the train operator re-franchising process.
- 5.12.16 Otherwise, we found that the Region complied with the procedure and definition for this measure and no material discrepancies were identified in the results reported.

London North Eastern Region

- 5.12.17 The Region undertook surveys at 25% of stations leased by GNER and WAGN during 2003/04, which met their internal target. Only 8% of the 204 stations leased by Arriva were inspected compared with a target of 25%; this shortfall was due to under-resourcing.
- 5.12.18 Otherwise, we found that that the Region complied with the procedure and definition for this measure and no material discrepancies were identified in the results reported.

Scotland Region

- 5.12.19 The Region undertook surveys at 20% of the stations. We found that the Region complied with the procedure and definition for this measure and no material discrepancies were identified in the reported results.

Southern Region

- 5.12.20 The Region undertook assessments at 8 of 559 stations (1.4%), of which only 3 were full surveys. This did not meet the 20% target; the shortfall was again due to under-resourcing and the relatively low priority given to this measure by Region.
- 5.12.21 Otherwise, we found that the Region complied with the procedure and definition for this measure and no material discrepancies were identified in the results reported.

Confidence grade

- 5.12.22 Network Rail has suggested a confidence grade for this measure of B2. This is accepted as being a realistic confidence grade for the factual score measured using the established procedure. However, we would note that this does not reflect the value of this measure as a true score of station facilities.

Observations

- 5.12.23 The major shortcomings of this measure have been discussed in detail in this and previous reports. It was therefore refreshing to hear the HQ champion wishes to consider possible changes to make the measure more representative and useful. Also in contrast to previous years, the champion undertook audits in accordance with the procedure and briefed the Regions on the scoring system.
- 5.12.24 All the Regions have responded favourably to these initiatives and generally do their best to conform to the procedures although there were some shortcomings due to the lack of resources available.

Recommendations

- 5.12.25 The M18 measure currently focuses only on quantity. In addition to the recommendations for previous years' reports, we recommend that the measure should be reviewed to include weightings for other facets of facilities such as quality, functionality, effectiveness, customer benefits, condition, maintenance costs and renewal costs.

5.13 Activity volumes (M20-M29)

Scope of audit

5.13.1 The audit was undertaken to assess the accuracy and confidence in the Activity Volumes figures presented in the Annual Return 2003/04 to the ORR. A total of ten separate measures are presented to monitor renewals activity across the following asset categories:

- (a) Track renewals, comprising renewals volumes for rails (M20), sleepers (M21), ballast (M22) and switches & crossings (M25)
- (b) Signalling renewals (M24)
- (c) Structures renewals, comprising renewals volumes for bridges (M23), culverts (M26), retaining walls (M27), earthworks (M28) and tunnels (M29).

5.13.2 We analysed supporting documentation supplied by Regional personnel for each of these measures. For the purpose of reporting our findings, we have grouped the ten renewals measures by asset category, i.e. track, signalling and structures.

Annual Return 2003/04 results

Regulatory target

5.13.3 There are no regulatory targets set for the activity volumes.

Results and analysis

Track Renewals

5.13.4 The track renewals category is divided into four separate measures. The 2003/04 figures for each of the track renewals measures are shown in Table 5.13.1.

Year	Rails (km)	Sleepers (km)	Ballast (km)	S&C (units)
2000/01	1064	475	496	n/a
2001/02	983	636	624	136
2002/03	1010	666	665	254
2003/04	1391	823	833	381

Table 5.13.1 Track renewals 2000-2004

5.13.5 The reported 2003/04 rail renewals volumes have increased by 30% compared with 2002/03. 2003/04 sleeper renewal volumes are 24% greater than last year and 73% higher than the 2000/01 level. A similar trend is apparent for ballast with renewals 68% greater in 2003/04 than 2000/01 levels and 25% greater than 2002/03. Switch & crossing (S&C) renewals have increased by 50% on 2002/03 levels and are almost three times greater than the level reported in 2001/02. The Annual Return 2003/04 also reports 5 partially renewed S&C units.

5.13.6 Figure 5.13.2 illustrates the increase in rail, sleepers and ballast renewed since 2000/01.

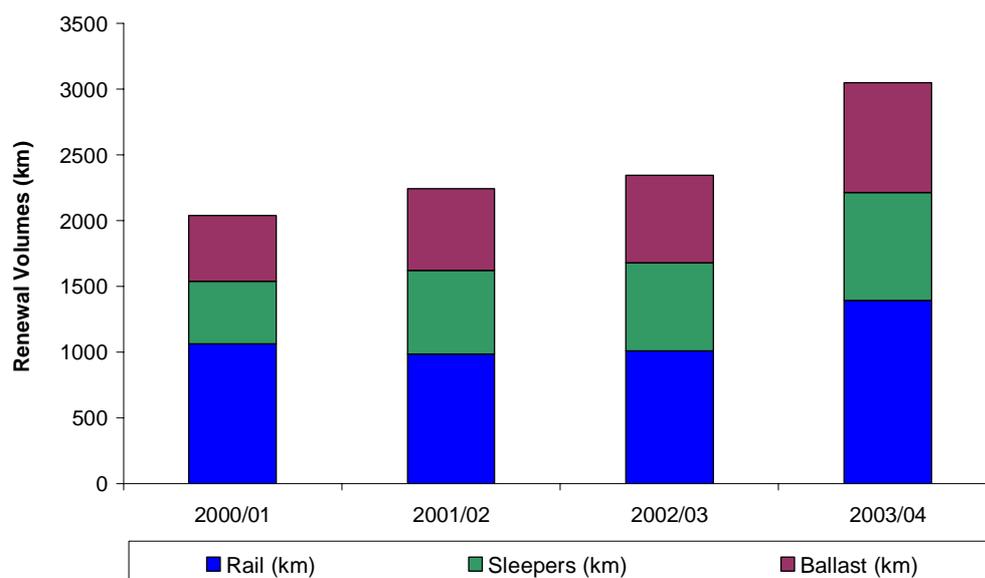


Figure 5.13.2 Rail, sleepers and ballast renewals

Signalling Renewals

- 5.13.7 We note that following our recommendations from previous years, the definition for signalling renewals has been redefined to provide a more realistic measure of activity.
- 5.13.8 Signalling renewals are now reported in terms of Signalling Equivalent Units (SEUs) renewed per annum. This is the first year this measure has been reported in the Annual Return; the concept of SEUs is however, already part of Network Rail's internal business planning and investment authorisation process. We would note that for SEUs to be useful in reporting, business planning or investment authorisation, SEUs should be broadly comparable in either output (impact on the operation of the network) or input (cost); otherwise SEUs would be an inconsistent unit of measure.
- 5.13.9 Figure 5.13.3 shows a drop in the number of SEUs renewed since last year.

	2001/02	2002/03	2003/04
Total SEUs renewed	1,338	1,440	1,120

Figure 5.13.3 Signalling Equivalent Units renewed

Structures Renewals

- 5.13.10 Network Rail report upon a total of five structures renewals measures, two of which, Earthworks (M28) and Tunnels (M29) renewals, are new for the 2003/04 reporting year. The definitions for the remaining measures, Bridges (M23), Culverts (M26) and Retaining Walls (M27) renewals were refined for the 2003/04 reporting year to reflect a more realistic level of renewals activity.

Structures Renewals Measure (2003/04)	No of Jobs	Area (m ²)
Bridges (> £100k)	178	5,611
Culverts (>£50k)	5	n/a
Retaining Walls (>£50k)	7	8,811
Earthworks (>£100k)	112	n/a
Tunnels (>£50k)	13	n/a

Figure 5.13.4: Structures Renewals volumes 2003/04

- 5.13.11 We have undertaken a high level analysis of the Regional supporting data for each of the renewals categories; however, the depth of analysis has varied from Region to Region and measure to measure because:
- (a) A significant proportion of the data presented in the Annual Return 2003/04 differs from Regional records. Network Rail has not provided us with sufficient evidence to discern if these differences are attributable to factual errors or represent changes to the reported data.
 - (b) The quality and consistency of supporting data varied between Regions.

Findings

Asset Reporting Manual

- 5.13.12 The ARM definitions and procedures for each of the activity volumes were revised in 2004. These revisions included:
- (a) A complete revision of the signalling renewals measure to establish the use of SEUs as a measure of renewals activity.
 - (b) The inclusion of "partial" S&C renewals as a measure of renewals activity.
 - (c) The addition of two new structures renewals, earthworks and tunnels.
 - (d) Further clarifications on the reporting of bridges, culverts and retaining walls renewals.
 - (e) Closer alignment of the regulatory reporting measures with Network Rail's internal performance monitoring measures, which are used for periodic business review and unit cost reporting.
- 5.13.13 There were no significant non-compliances found against the Asset Reporting Manual requirement during our Regional audits.
- 5.13.14 The renewals workbank planning and management process has improved during the 2003/04 reporting year. The following factors have contributed to our increasing confidence in this area:
- (a) The use of a priority-based system of renewals workbank planning ensuring those jobs which require completion are completed within the reporting year with minimum disruption to the renewals workbanks;
 - (b) The implementation of the GRIP process to adequately plan renewals activities;
 - (c) The increasing use of unit costs to more accurately scope and price renewals activities; and
 - (d) The monthly and quarterly business review processes undertaken internally to maintain a tighter control on the workbank than observed in previous audits.
- 5.13.15 Renewals workbanks are still susceptible to fluctuations throughout the year. Analysis of Regional data has shown that project deferrals and changes to scope are the key drivers behind the budget under-spends reported for each Region.

East Anglia Region

- 5.13.16 Personnel responsible for the management and reporting of renewals workbanks displayed a good working knowledge of the reporting processes outlined in the Asset Reporting Manual. Supporting data provided by the Region verified some of the data presented for the Annual Return; however the following shortfalls were observed:
- (a) The Regional process owner, responsible for the 'sign-off' of the Regional renewals data prior to submission into the Annual Return displayed very little knowledge of the renewals reporting process and could not validate the numbers reported. We are pleased that this shortfall was rectified during the period of the audits.
 - (b) The Region's organisation of the activity volumes audits was poor, leaving key personnel with little time to prepare for the audits.

- (c) The level of supporting documentation in electronic form was low, limiting the level of analysis that could be undertaken on the reported numbers.

Track Renewals

- 5.13.17 The process for the management and reporting of the track renewals workbanks has not changed from that observed during the 2002/03 audits. An analysis of the Regional workbank confirms the renewals data submitted by the Region to HQ; however, the rail and sleeper volumes published in the Annual Return do not accord with this data.
- 5.13.18 Analysis of the Regional data also shows that the track renewals workbank was less susceptible to fluctuations and changes during the 2003/04 reporting year compared to that observed in other Regions. We believe this relative stability of the workbank to the use of a priority-based renewals planning system, allowing the Region to more accurately plan its renewals activities.

Signalling Renewals

- 5.13.19 The Region reports 367.5 SEUs, 98% of which are attributed to the West Anglia Route Modernisation (WARM) programme and were supplied by the WARM project office. The remainder are attributable to minor works involving level crossing renewals.
- 5.13.20 Regional personnel verified the SEU figures supplied by the WARM project office using scheme plans and records detailing the completion of renewals works. A formal process used to calculate SEUs was not developed within the Region. Supporting data verifying the SEU counts in the Region was limited providing little information on SEUs other than the discussions held with Regional personnel.

Structures Renewals

- 5.13.21 We cannot reconcile the figures presented in the Annual Return for culverts and retaining walls renewals with the Regional data presented at audit.

London North Eastern Region

- 5.13.22 The reporting processes applied in the Region were observed to comply with the requirements set out in the Asset Reporting Manual. Our findings for each of the renewals categories are summarised below.

Track Renewals

- 5.13.23 The Region presented comprehensive data, in electronic form, supporting its track renewals submission for the Annual Return reporting process. The Region delivered higher volumes than forecast for both rail and sleepers, by 6% and 12% respectively. The Region's ballast renewals were in line with budget.
- 5.13.24 However the rail and sleeper volumes presented in the Annual Return do not concur with the Regional data presented at audit. Maintenance volumes have not been included in the reported figures.
- 5.13.25 The number of S&C units renewed presented in the Annual Return cannot be validated using the supporting data provided by the Region.

Signalling Renewals

- 5.13.26 The Region reports a total of 98 SEUs which are based on four large signal interlocking projects delivered during the 2003/04 reporting year.
- 5.13.27 Regional personnel demonstrated a good understanding of the application of the new signalling renewals measure and were able to provide clear and consistent supporting data outlining the calculation of the SEU figure presented in the Annual Return.

Structures Renewals

- 5.13.28 The Region outlined the process for the reporting of the various structures renewals measures however little supporting data was provided to validate the figures reported in the Annual Return.
- 5.13.29 The figures presented in the Annual Return for bridge, earthworks and tunnel renewals do not concur with Regional data presented at audit.

Scotland Region

5.13.30 The reporting processes applied in the Region were observed to comply with the requirements set out in the Asset Reporting Manual. Our findings for each of the renewals categories are summarised below.

Track Renewals

5.13.31 The Region presented comprehensive data supporting its track renewals submission for the Annual Return reporting process. Our analysis shows that:

- (a) 17% of the forecast track renewals expenditure was deferred into 2004/05 and 2005/06;
- (b) 10% of the actual reported track renewal spend for the 2003/04 reporting year comprises of new works not provided for in the original business plan forecasts;

5.13.32 However, there are disparities between the rail and sleepers volumes presented in the Annual Return and those presented at audit.

Signalling Renewals

5.13.33 The Region reports a total of 99.3 SEU renewed during the 2003/04 reporting year, 98% of which are attributable to works undertaken on the Edinburgh to Waverly signalling renewals scheme.

5.13.34 The Region based its SEU count on the manual checking of scheme plans against records of renewals activities undertaken on-site. The Region did not provide supporting data validating the SEU figure presented in the Annual Return.

Structures Renewals

5.13.35 Improvements to the management and reporting of structures renewals workbanks were implemented during the 2003/04 reporting year to better define and cost the Region's structures renewals activities.

5.13.36 Analysis of the Region's supporting data has shown that the Region delivered 77% of its committed expenditure on structures renewals. The shortfall of 23% is due to significant project deferrals, mainly in earthworks renewals, and the use of efficiency drivers to reduce costs. Approximately 5% of the actual structures renewals expenditure is attributed to emergency works not provided for in the original business plan forecasts.

5.13.37 Regional supporting data concur with the structures renewals submissions reported in the Annual Return; however, the Reporters have noted some inconsistencies between the figures presented in the Annual Return for bridge and tunnel renewals with that held in the Regional supporting data presented at audit.

Southern Region

5.13.38 The reporting processes applied in the Region were observed to comply with the requirements set out in the Asset Reporting Manual. Our findings for each of the renewals categories are summarised below.

Track Renewals

5.13.39 Following issues regarding data quality and integrity identified during the 2002/03 reporting year, the Region revised its commercial track renewals reporting processes to promote a higher level of data integrity and reliability. Guidelines issued by Network Rail HQ helped provide for a more robust prioritisation and planning of track renewals than observed in previous Annual Return audits.

5.13.40 The figures presented in the Annual Return concur with the high-level Regional data provided at audit. Detailed supporting data was not provided to establish a more comprehensive audit trail.

5.13.41 In contrast to other Regions, Southern Region has included maintenance volumes in its Annual Return submission which has resulted in the reported rail volumes for 2003/04 being significantly higher than renewals forecast from the Business Plan.

Signalling Renewals

- 5.13.42 The Region reports an SEU total of 145, 72% of which are attributable to major signalling works on the Dorset Coast re-signalling programme, with the remainder attributable a collection of minor works including level crossing renewals.
- 5.13.43 The Region based its SEU count on scheme plans but did not provide further supporting information on the calculation used to determine the number of SEUs reported.

Structures Renewals

- 5.13.44 The Region's actual structures renewals spend for the 2003/04 represents 94% of the forecast expenditure for the year. Bridge and earthworks renewals expenditure is reported 12% higher than forecast due to scheme overruns and new projects not included in the original business plan forecasts. Significant under-spends of 25% against plan are reported under tunnels, drainage and Bridgeguard 3 activities due to project deferrals and scope reductions.
- 5.13.45 There are inconsistencies between the structures renewals figures presented in the Annual Return and those presented in the Regional supporting data at audit. Analysis of the Regional data identified further, but minor, inconsistencies in the reporting of the actual volumes of structures renewals.

Confidence grade

- 5.13.46 The confidence grades listed below are based on discussions with Regional personnel for each renewals category, the quality of supporting data provided by each Region and the consistency of Regional data with the Annual Return submissions to Network Rail HQ.

East Anglia Region

- 5.13.47 The confidence grades for each renewals category are as follows:
- (a) Track renewals (M20, M21, M22, M25): B2
 - (b) Signalling renewals (M24): C2
 - (c) Structures renewals (M23, M26, M27, M28, M29): C2

London North Eastern

- 5.13.48 The confidence grades for each renewals category are as follows:
- (a) Track renewals (M20, M21, M22, M25): B2
 - (b) Signalling renewals (M24): A1
 - (c) Structures renewals (M23, M26, M27, M28, M29): B2

Scotland Region

- 5.13.49 The confidence grades for each renewals category are as follows:
- (a) Track renewals (M20, M21, M22, M25): A2
 - (b) Signalling renewals (M24): C2
 - (c) Structures renewals (M23, M26, M27, M28, M29): B2

Southern Region

- 5.13.50 The confidence grades for each renewals category are as follows:
- (a) Track renewals (M20, M21, M22, M25): B2
 - (b) Signalling renewals (M24): C2
 - (c) Structures renewals (M23, M26, M27, M28, M29): B2

Recommendations

- 5.13.51 We believe a target of B2 should be achievable for measures M20-M29. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
- 5.13.52 In most cases, we were unable to consistently analyse each renewals workbank *at the project level* in a systematic manner, especially where projects were deferred or substituted for new previously un-budgeted projects. We would expect a single standardised workbank spreadsheet or other system to monitor forecast budgets in the Business Plan, year-start financial budgets, forecasts, actuals (ie inputs), project substitutions, project deferrals, outputs delivered and output targets at a project and workbank level. We recommended this is the minimum required, given the levels of expenditure involved and importance of the workbank in the renewals process. It would be invaluable to renewals engineers in their day-to-day monitoring of workbanks, investment panels in their authorisation of un-budgeted projects and would, of course, provide a suitable audit trail for the results reported in the Annual Return.
- 5.13.53 The inclusion of maintenance volumes in track renewals volumes was inconsistent between Regions. We recommend that a review of the process for reporting this information is undertaken and changes made to the ARM procedures as appropriate. We suggest that MIMS is the preferred source for this data.
- 5.13.54 With the exception of London North Eastern Region, little supporting data was received from the Regions detailing how SEUs were calculated and reported. We recommend that procedure for measure M24 should require the sign-off sheet shows each renewals project, the SEUs delivered, any weighting factors used in their calculation and a brief justification for the weighting factor used.
- 5.13.55 The definition of SEUs as outlined in the Asset Reporting Manual requires further clarification. We found under-reporting due to the imprecise definition for reporting of life extension works and minor renewals. We recommend that the procedure gives guidance on the reporting life extension works and minor renewals.
- 5.13.56 The structures renewals measures for culverts, earthworks and tunnels currently do not adequately represent the level of expenditure and activity undertaken by Network Rail. The measures for bridges and retaining walls report the number of jobs and the area in square metres affected to give a measure of size. We recommend that an indication of size is also required for the culverts, earthworks and tunnels measures. We suggest a linear metre might be an appropriate measure, though earthwork volumes, tunnel wall surface area and other alternatives should also be considered.
- 5.13.57 Analysis of Regional data shows Network Rail incurs significant spend on drainage works which are not reported in the Annual Return. We recommend that a measure of drainage renewal should be considered, such as drainage jobs greater than £50k and linear metres renewed.
- 5.13.58 The revisions made to the definition of S&C renewals, allowing for the inclusion of "partial" renewals, has had little effect on the reported figures with only 5 partial renewals being reported nationally in the Annual Return 2003/04. Network Rail acknowledges the difficulty it has had in defining S&C renewals to reflect the level activity undertaken on S&C units. We recommend that a review is undertaken to understand the issues in this area and changes made as appropriate.
- 5.13.59 We recommend the Annual Return renewals reporting process should be aligned with Network Rail's internal business reporting processes which provide, on a monthly and a quarterly basis, detailed information on renewals activities based on unit costs, project progress and out-turn. This would create a more robust reporting process for the Annual Return data and reduce the work associated with two parallel reporting systems.
- 5.13.60 We recommend the cost distribution of renewed SEUs should be plotted as part of a review of using SEUs to measure renewals activity.

5.14 Network capability (C1-C4)

Scope of audit

5.14.1 The audit was undertaken to assess the accuracy and reliability of the Network Capability data presented in the Annual Return 2003/04, which is reported across the following four measures:

- (a) Linespeed Capability (C1);
- (b) Gauge Capability (C2);
- (c) Structures Route Availability (C3);
- (d) Electrification (C4).

5.14.2 The audits included an assessment of Regional compliance with the procedures laid out in the ARM for each of the capability measures and an assessment of the quality of supporting data provided by each Region. The audit did not include an interrogation of key Network Rail databases such as GEOGIS and RARMaps.

Results

Regulatory targets

5.14.3 The regulatory target for each of the network capability measures is for no overall reduction in functionality during the control period except as agreed through the Network Change procedure.

Results and analysis

Linespeed capability

5.14.4 Linespeed capability is a measure of the length of running track in kilometres within five speed bands. Figure 5.14.1 shows the reported linespeed capability, in kilometres, for each speed band over the last three years.

Speed Band (mph)	2001/02	2002/03	2003/04
<35	4,427	5,289	5,570
40-75	17,462	16,978	16,585
80-105	7,724	7,106	6,994
110-125	2,359	2,393	2,415
125+	0	0	0
Total	31,972	31,766	31,564

Table 5.14.1: Linespeed capability

5.14.5 The net change in the total kilometres of track reported between the 2001/02 and 2003/04 a reduction of 1.3%; however, the year on year variance between individual speed bands is more significant as Figure 5.14.2 shows. The most significant changes this year are an increase of 5% in band '<35 mph' and a reduction of 2.3% in band '40-75'. The change between 2001/02 and 2002/03 is greater than that reported this year between 2002/03 and 2003/04. These variances have been caused by either:

- (a) Data cleansing and corrections undertaken as part of the Geogis Data Improvement Programme;
- (b) Physical changes to the network leading to alterations in the linespeed of running track.

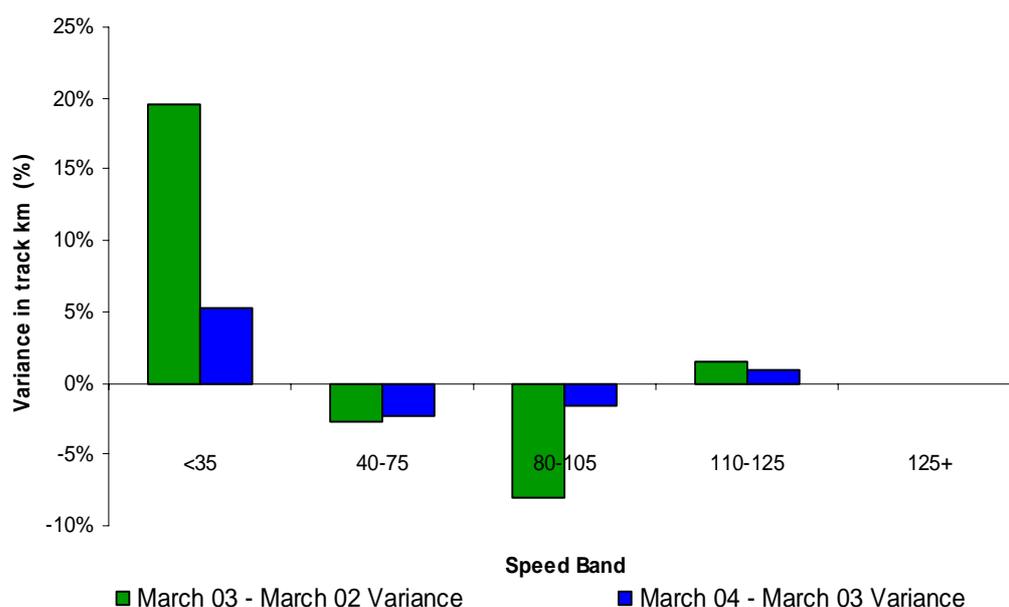


Figure 5.14.2 Year-on-year variance in track km across speed bands

5.14.6 The Annual Return 2003/04 lists a total of 134 linespeed changes, 69% of which were linespeed increases (Annual Return Tables 73 and 74). These changes are described using the linespeed quality bands derived from track geometry outputs which are different from the speed bands used for this measure (Figure 5.143.1 above and Annual Return Table 73).

Gauge Capability

5.14.7 Gauge capability is a measure of the length of route in kilometres capable of accepting different freight vehicle types and loads. The results are reported across five gauge bands, W6, W7, W8, W9 and W10.

5.14.8 This year the presentation of the data has changed with only the maximum gauge of each section of route identified. Network Rail report a network total gauge capability of W6 or greater of 16,670km, 42 km more than the 2002/03 total.

Structures Route Availability

5.14.9 Structures route availability is a measure of the length of track in kilometres capable of accepting different loaded vehicle types. The measure is recorded across 10 route availability (RA) bands, corresponding to the maximum permissible axle load over a structure. For reporting purposes, route availability is divided into three groups of RA band as shown in Figure 5.14.3 below.

RA Band	2001/02	2002/03	2003/04
RA 1-6	2,321	2,411	2,375
RA 7-9	26,196	24,262	26,297
RA 10	2,582	4,734	2,585
Total	31,099	31,407	31,257

Table 5.14.3 Structures route availability

5.14.10 The total kilometres of track reported for this measures between the 2001/02 and 2003/04 reporting years has reduced by 0.5%. However the year on year variance between individual RA bands is more significant as Figure 5.14.4 shows.

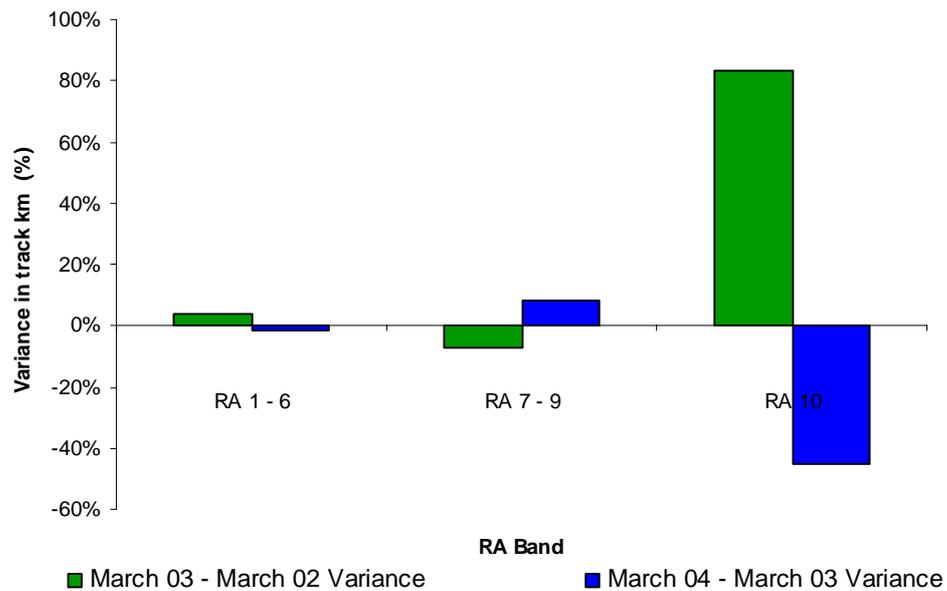


Figure 5.14.4 Year-on-year variance for structure route availability

- 5.14.11 Since 2001/02 there has been a significant change in the number of track kilometres classified as RA10. This increased by over 80% in 2002/03 but has reduced by nearly 45% this year.
- 5.14.12 This significant rise and fall in successive years is due to errors in the 2002/03 figures which have been subsequently corrected during data correction and cleansing exercises using the MapInfo reporting system. Data corrections this year have included transfer of 1,908 km of track from RA10 to RA8 in East Anglia Region and addition of 270km to RA8 in North West Region.

Electrification

- 5.14.13 Electrification capability provides a network wide measure of the extent of the electrified network, in kilometres, by three electrification types as shown in Table 5.14.5.

Type	2001/02	2002/03	2003/04
25 kV a.c. overhead	7,937	7,751	7,780
3rd rail 650/750 V d.c.	4,493	4,463	4,483
Dual a.c. overhead & 3rd rail d.c.	0	33	33
1500V d.c. overhead	0	19	19
Total	12,430	12,266	12,315

Table 5.14.5 Electrification capability

- 5.14.14 There has been little change in the electrified line capability over the last three years. The reported network total for 2003/04 is 49km greater than that reported in 2002/03. The difference is caused by:
- Physical works – primarily CTRL, WCRM and Sunderland Direct – have resulted in an increase in the electrified track capability by 71km;
 - Data correction and cleansing exercises on 2002/03 data, undertaken as part of the GEOGIS Data Improvement Programme, have reduced the overall electrified track capability by 22km.

Findings

Asset Reporting Manual

- 5.14.15 The ARM definitions and procedures for network capability were significantly revised in 2004 to provide greater clarity. These revisions also served to emphasise Network Rail HQ's role as the key data collection and verification agent in the reporting process.

Process

- 5.14.16 The process of reporting the network capability measures has not changed from the 2002/03 reporting year in that:
- (a) Network Rail HQ undertake data analysis on capability data held in the two main data sources: (1) GEOGIS, used for the linespeed and electrification capability measures and (2) MapInfo, used for gauge and structures route availability measures.
 - (b) Network Rail HQ reports what it believes is the correct data across all four capability measures for each Region.
 - (c) Each Region verifies the data issued by Network Rail HQ prior for inclusion in the Annual Return.
- 5.14.17 However, as observed in previous audits, the network capability reporting process varies between Regions in that:
- (a) Little proactive reporting of capability data is undertaken during the reporting year
 - (b) The validation techniques undertaken by each Region on data issued from Network Rail HQ vary from high level sense checks to the interrogation of data recording and reporting systems such as GEOGIS
 - (c) Non-compliances against the Asset Reporting Manual were found in respect of the verification and reporting requirements of Regional data.
- 5.14.18 Generally, only a small percentage of physical changes to network capability were reported by Regional personnel; however, they acknowledged that changes would appear in the Annual Return as a result of the data cleansing exercises undertaken at Network Rail HQ on GEOGIS and MapInfo data.

Annual Return

- 5.14.19 The Annual Return commentary provided for linespeed capability does not accurately describe the data reported. In contrast to the commentary:
- (a) The network total for linespeed capability *does* include small amounts of track in sidings and depots;
 - (b) The individual linespeed changes listed in Table 73 and 74 are primarily based on data corrections and *not* physical changes to the network.
- 5.14.20 There is an inconsistency in the manner in which linespeed capability changes are reported in Table 72 and Tables 73 and 74. Table 72 specifies speed bands as defined in the Asset Reporting Manual where as Tables 73 and 74 list changes to linespeed by linespeed quality bands based on track geometry outputs.
- 5.14.21 Furthermore, Network Rail state that the data presented in Tables 73 and 74 was supplied by track geometry personnel, however, linespeed change data provided by the track geometry personnel lists 112 individual changes to linespeed, as opposed to the 134 listed in Tables 73 and 74.

Confidence grade

- 5.14.22 As the majority of the data collection, analysis, verification and reporting of the network capability measures is undertaken by Network Rail HQ, this year we propose one confidence grade based on:

- (a) The steps undertaken by Network Rail HQ to improve the accuracy of the network capability data through its data quality improvement programmes on the GEOGIS and MapInfo reporting systems
- (b) The general level of understanding of the reporting process observed in the Regions
- (c) The quality of Regional supporting data verifying HQ data returns.

5.14.23 Based on these parameters, we believe this measure merits a confidence grade of B2.

Observations

5.14.24 It was evident from our Regional audits that network capability data was felt to be of little use to the Regions in their day to day management of the assets because:

- (a) Regions rarely use the network capability data besides from the reporting process for the Annual Return;
- (b) Network Rail HQ has assumed the role of the main data collector, provider and verifier, leaving the Regions with little proactive input into the treatment of the capability data.

5.14.25 The on-going cleansing and correction of data in MapInfo and the implementation of the GEOGIS Data Improvement Programme are the key contributing factors to the higher level of data accuracy reported in the Annual Return 2003/04.

Recommendations

5.14.26 There has been a general increase in accuracy for the network capability measures in the Annual Return 2003/04. However, the process of reporting and validating network changes requires further consolidation to ensure Regions are consistent in their understanding and implementation of the reporting processes. We recommend further guidance, communications or training is required to further improve the accuracy of these measures.

5.14.27 We found evidence of delays in reporting of linespeed changes of up to six months, particularly where physical changes to the network result in a change to track formation. Although linespeed changes are reported immediately in the weekly operating notices, the process for updating GEOGIS is often slow. We recommend this process is reviewed and appropriate changes made as necessary.

5.14.28 We recommend that Network Rail adopt a consistent approach in the reporting of linespeed data (M3 speed band data and C1 linespeed capability); we suggest the track geometry bands should be used for both measures.

5.14.29 The network capability measures provide little indication of the true capability of the network. For example, the structures route availability figures do not include the maximum permissible speed at which vehicles may travel over structures with particular RA values, a highly important factor in understanding:

- (a) The operating characteristics of particular routes
- (b) Any improvements made to structures to allow the operation of rail services at higher speeds.

We recommend that Network Rail, ORR and our auditors should discuss further measures that might better provide a measure of network capability.

5.15 Reconciliation for Business Plan 2003/04

Scope of audit

5.15.1 The audit was undertaken to validate the reconciliation statements presented in the Annual Return 2003/04. The audits focussed on cross-checking the numbers presented in the Annual Return with Regional documentation and reporting processes, highlighting any potential errors or causes for concern.

Annual Return 2003/04 results

Results and analysis

5.15.2 Network Rail report maintenance, renewal and enhancement expenditure by Region with a further breakdown of these figures by line of route. For the 2003/04 reporting year Network Rail report:

- Total renewal spend of £3,203m, 10% lower than the business plan forecast of £3,545m
- Total maintenance spend of £1,245m, 9% lower than the business plan forecast of £1,360m
- Total enhancements spend of £770m, almost 40% below the business plan forecast of £1,238m.

5.15.3 Network Rail report a total network expenditure of £5.2 billion for 2003/04, 16% higher than the expenditure incurred during the 2002/03 reporting year. Figure 5.15.1 shows the increase rise in expenditure over the last four years.

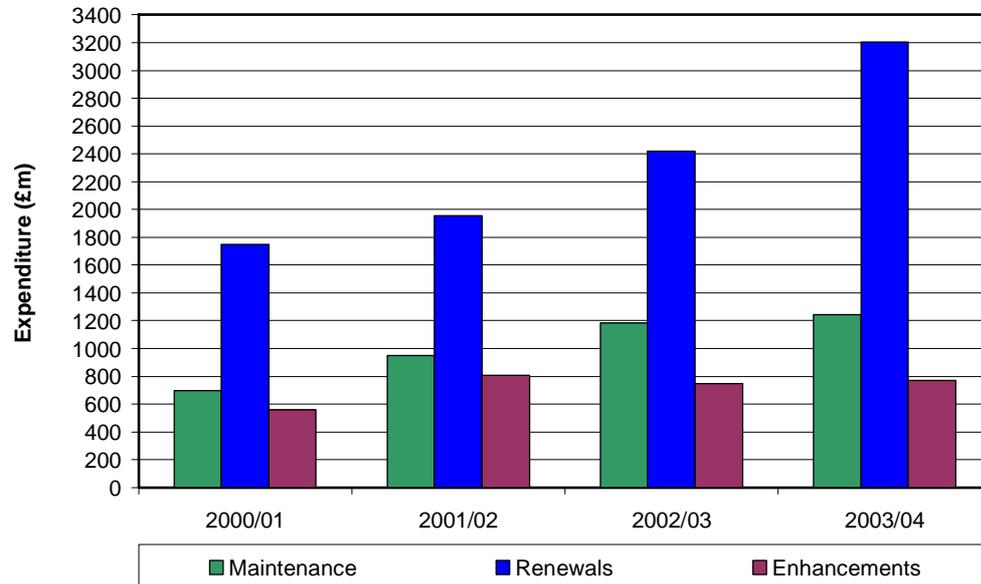


Figure 5.15.1 National expenditure

5.15.4 For 2003/04, 61% of the total reported network expenditure was spent on renewals, 24% on maintenance and the remainder on network enhancements.

5.15.5 Renewals expenditure has increased by 32% on 2002/03 levels. Figure 5.15.2 shows the distribution of variances across each of the renewals categories for:

- (a) 2003/04 compared with the reported 2002/03 figures and
- (b) 2003/04 compared with the 2003 forecast.

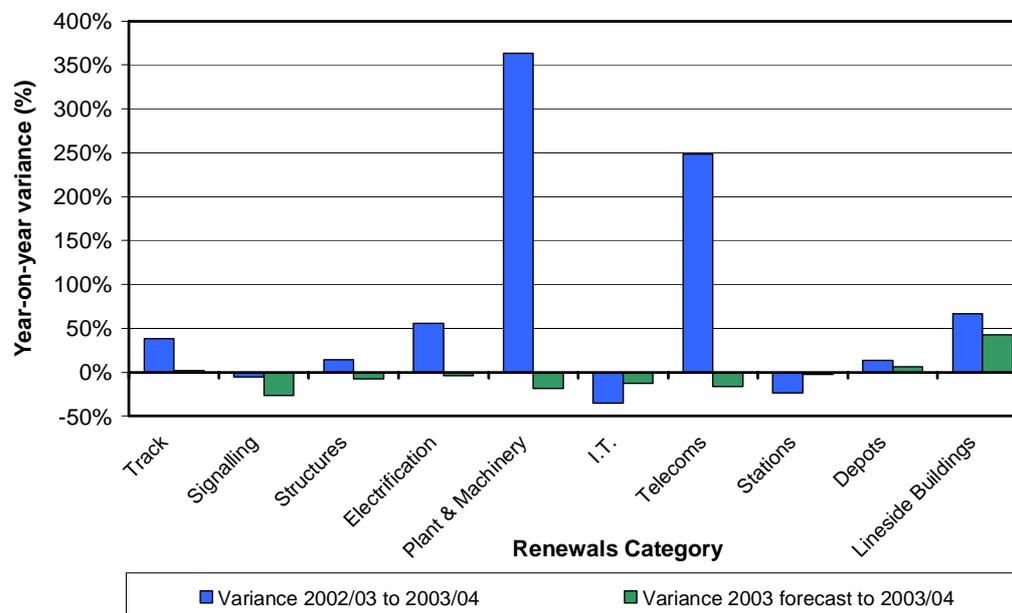


Figure 5.15.2 Renewals variances (2003/04 vs 2002/03 and 2003/04 vs 2003 forecast)

5.15.6 Expenditure levels in seven out of ten categories were higher for 2003/04 than for 2002/03. Actual spend for 2003/04 was below 2003/04 Business Plan forecasts. Key variances against plan were caused by:

- (a) Signalling: reported expenditure is 27% below the planned level due primarily to the reallocation of funding between signalling and telecoms on the West Coast Route Modernisation. Delays to various signalling schemes as a result of technical problems and a lack of resources have also affected scheme deliverability and expenditure incurred.
- (b) Plant and machinery: reported expenditure is 19% below plan due to National Logistics Unit under-spend on depot development projects, high output machinery.
- (c) Telecoms: reported expenditure is 16% below plan due to programme delays and scope reductions to fixed telecom networks and GSM-R projects.
- (d) Information Technology: reported expenditure is 12% below plan driven by under-spends due to the I.T restructuring programme developed to accommodate the in-sourcing of infrastructure maintenance contracts.

5.15.7 Scope reductions and programme delays have contributed to the 40% shortfall in enhancements expenditure incurred against planned during the 2003/04 reporting year.

5.15.8 The principal factors behind the reduction are:

- (a) £219m under-spend for the Southern Region new trains programme
- (b) Scope reductions on the TPWS programme resulting in a £89m under-spend
- (c) £55m under-spend due to de-scoped SRA projects.

Findings

Process

- 5.15.9 The process for reporting network expenditure has not changed from that observed during the 2002/03 audits. Following external publication of the business plan, internal regional expenditure forecasts are submitted and revised iteratively in response to efficiency overlays and financial constraints defined by Network Rail HQ. As a result, the finalised Regional budgets for the 2003/04 reporting year differ from those published in the 2003/04 Business Plan.
- 5.15.10 Network Rail's project control and business planning systems do not provide the functionality required to report this measure disaggregated by route; we found Regional personnel using supplementary methods to manage and report expenditure levels for regulatory purposes.
- 5.15.11 Similarly, Regional personnel use non-standardised (i.e. user-defined) spreadsheets for constructing and monitoring Regional renewals workbanks and associated expenditures. We found these spreadsheets increasingly include systems for workbank prioritisation based on the likely effects of individual renewals activities on safety, operational performance and regulatory targets.
- 5.15.12 We found evidence of unit cost reporting across the main renewals categories such as track and structures; this should improve the consistency and accuracy of Network Rail's business plan estimates for renewals activity.

East Anglia Region

- 5.15.13 East Anglia Region reports a total network spend of £295.5m, 46% of which was incurred on renewals, 49% on maintenance and the remainder on enhancements.
- 5.15.14 The Region provided supporting data that verifies the renewals and maintenance expenditure levels reported in the Annual Return 2003/04; however, the forecast and actual enhancement expenditure presented in the Annual Return does not reconcile with Regional data presented at audit. The Annual Return does not provide a commentary for the Region's enhancement spends.
- 5.15.15 Analysis of supporting data provided by Regional personnel indicates that:
- (a) Approximately £8.2m of the Region's forecast expenditure has been delayed or deferred into 04/05
 - (b) Approximately £6m of the total renewals expenditure incurred relates to activities not included in the original business plan forecasts
 - (c) The remaining variances are attributable to the re-allocation of funding across asset categories, efficiency and deliverability overlays and scheme delays.

London North Eastern Region

- 5.15.16 The Region reports a network total spend of £441.1m, 56% of which was incurred on renewals, 37% on maintenance and the remainder on enhancements.
- 5.15.17 The actual expenditure for renewals and maintenance reported in the Annual Return 2003/04 concurs with supporting data presented by the Region; however, the reported enhancement expenditure cannot be reconciled with Regional data.
- 5.15.18 We were able to undertake a high-level assessment of the 2003/04 actual expenditure but the Regional performance against its forecast could not be reconciled using the supporting data. We did not receive all of the data requested.

Scotland Region

- 5.15.19 Scotland Region reports a network total spend of £271m, 51% of which was incurred on renewals, 41% on maintenance and the remainder on enhancements.

- 5.15.20 The Region provided supporting data which concurred with the figures presented in the Annual Return. Analysis of the supporting data indicates that:
- (a) Approximately 20% of the forecast expenditure was deferred or delayed into 2004/05
 - (b) Approximately 20% of the actual expenditure reported relates to new projects not included in the original Business Plan forecasts
 - (c) The variance between actual expenditure and forecast, excluding project deferrals or new projects, is approximately 22%, the majority of the variance being attributed to project under-spends.

Southern Region

- 5.15.21 Southern Region reports a network total spend of £542.9m, 45% of which was incurred on renewals, 45% on maintenance and the remainder on enhancements.
- 5.15.22 The Regional forecast and expenditure figures presented in the Annual Return 2003/04 do not concur with the supporting data provided for the reconciliation assessment. The supporting data contains different forecast and actual expenditure data which varies up to 5% from the data presented in the Annual Return.

Confidence grade

- 5.15.23 We have been unable to reconcile some of the Regional data provided at audit (or thereafter) with the results in the Annual Return. It is possible that this is due to our receiving incomplete datasets. We have applied confidence grades using the data we have received
- (a) East Anglia supplied reliable supporting data allowing a reasonable level of analysis to be undertaken. Regional personnel demonstrated a good understanding of the reporting and management of expenditure levels. Confidence grade A2.
 - (b) We could not reconcile the data presented by London North Eastern with the Annual Return results nor did we receive all of the follow-up data requested. Confidence grade B3.
 - (c) Scotland personnel demonstrated a good understanding of reporting and management of expenditure levels. Supporting data, provided in electronic form was of a reasonable quality to allow high level analysis on Regional data. Confidence grade A2.
 - (d) We have been unable to reconcile the figures in the Annual Return with the supporting data provided by the Southern Region. Confidence grade B3.

Observations

- 5.15.24 Network Rail personnel have demonstrated a more confident and robust approach to the management of costs than observed in previous Annual Return audits. The use of prioritised workbank planning systems and the increasing use of unit costs have allowed Network Rail to develop more robust renewals plans.
- 5.15.25 Workbank expenditure was observed to be linked to a variety of programme and project management tools, such as P3, allowing delivery engineers greater control of their workbanks thereby improving the general cost management process.
- 5.15.26 The internal monthly and quarterly business reporting processes provide a suite of information related to all aspects of Network Rail's asset management, renewals and expenditure activities. These processes help to promote the usage and understanding of unit cost reporting and have had a positive effect on the management and reporting of expenditure throughout the reporting period.

- 5.15.27 We note that Network Rail HQ has been more transparent in its treatment of Regional expenditure forecasts than observed in previous years. This has meant Regional personnel were able to identify efficiency and deliverability overlays in the business plan, improving our ability to more accurately reconcile Regional data presented at audit with data published in the Business Plan and Annual Return.
- 5.15.28 Network Rail is currently planning to implement a new financial management tool. In preparation for implementation of the investment management system (IMS), Network Rail HQ requested all Regions undertake a data cleansing exercise to ensure that expenditure levels were correctly classified and reported. Southern Region reported a number of balancing items this year to correct previous years' reported data. We found no evidence of the other Regions we audited undertaking similar data cleansing exercises in response to the request from HQ.

Recommendations

- 5.15.29 We recommend that personnel attending audits for the reconciliation against Business Plan in future years should have sufficient evidence and knowledge of an audit trail to support the figures presented in the Annual Return.
- 5.15.30 To support the reconciliation against Business Plan for regulatory reporting purposes, we recommend the proposed financial management tool IMS should – in addition to any other stakeholder or user requirements – have sufficient functionality to: (a) report data on a route-basis and (b) report variances between the published Business Plan, the year-start Budgets and year-end Actuals for routes and organisational units.
- 5.15.31 The supplementary business planning, budget management and reporting systems observed in the Regions has improved the day to day management of the renewals and investment portfolios, however these user-defined systems are not risk-free. We recommend Network Rail systematically check these supplementary systems.

5.16 Customer reasonable requirements

Scope of audit

5.16.1 There are three principle areas addressed by the audit:

- (a) To check compliance with the procedure for managing customer reasonable requirements (CRRs) as set out in Network Rail Commercial Manual (section 5.1, version 7, dated January 2004)
- (b) To verify the validity of the data contained within the Annual Return.
- (c) To identify the trends in the creation, progression and conclusion of the CRRs.

5.16.2 Audits were undertaken at Network Rail Headquarters and for East Anglia, Scotland, Southern and London North Eastern Regions during May and June 2004.

5.16.3 This measure assesses Network Rail's responsiveness to its customers and its progress in delivering for its customers.

Annual Return 2003/04 results

Regulatory target

5.16.4 Regulatory targets have not been set for customer reasonable requirements.

Results and analysis

5.16.5 22 CRRs from three customers were submitted during the year. 71 CRRs from 24 customers were withdrawn or completed during the year, leaving 112 live CRRs at the close of the reporting year.

5.16.6 A significant proportion of those withdrawn failed the SMART+f criteria (specific, measurable, achievable, relevant, time based, funded) which Network Rail's customer account teams have been using to validate existing CRRs.

5.16.7 Figure 5.16.1 shows the total number of CRRs at year end has declined by 89% in four years whilst the number of CRRs submitted by customers has declined by 94%.

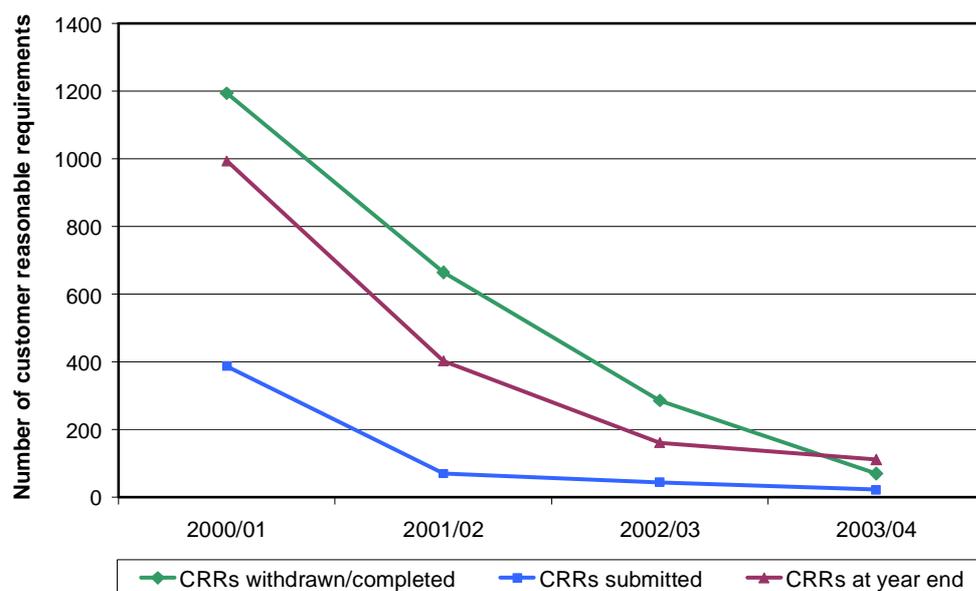


Figure 5.16.1 Use of the customer reasonable requirements process

- 5.16.8 The supporting statement in the Annual Return does not comment on the decline in CRRs submitted by customers. A number of possible explanations were suggested by Network Rail personnel during the audits:
- (a) Network Rail and train operator customers have increasingly focussed on delivering current performance. Network Rail has been remitted to focus on operations maintenance and renewals not enhancements; SRA has taken increasing responsibility for enhancements over this period. Only those customers outside the direct regulatory regime (eg EWS) continue to retain a significant interest in the value of CRRs as a means of ensuring the delivery of funded projects.
 - (b) Funding for enhancements has been through SRA 'vehicles' such as Incremental Output Statements, Single List of Enhancements and project-specific contracts rather than through the CRR process.
 - (c) PTEs were initially significant users of the CRR process, using CRRs to obtain information or develop enhancement schemes; external consultants have increasingly taken this role from Network Rail.
 - (d) The Local Output Commitments (LOC) process has become the prime focus of the commercial relationship between Network Rail and customer. There are several instances of CRRs being redefined and included in LOCs. It would appear from discussions with the account teams that the LOC process will provide a more complete picture of what, how and when Network Rail is achieving delivery for its customers.
 - (e) Strict application of the SMART+f test by Network Rail customer account teams has reduced the number of existing CRRs and number of CRRs submitted.
- 5.16.9 The CRR process is the only externally monitored measure of Network Rail's responsiveness to its customers. It acts as a "safeguard of last resort" for customers but has little value as a representative measure of activities undertaken for its customers. We believe the measure should be enlarged to include LOCs and other specific activity requests from customers where external funding has been allocated.

Findings

Process

- 5.16.10 The CRR database is centrally managed at HQ; account teams have password controlled access to input and update CRR information in the database. HQ personnel manually transfer the results from the reporting database and produces the supporting Annual Return commentary from those entered by customer account teams.
- 5.16.11 We reviewed outputs from the CRR reporting database with the account teams in the Regions:
- (a) Evidence was found in the reporting database for all CRRs reported in the Annual Return. However, some of the commentaries for CRRs we reviewed were over 12 months old, suggesting CRRs in the database are not regularly or frequently reviewed by account teams.
 - (b) Use of the CRR information appears to be determined by the degree of interest expressed by the individual customer. CRRs are only discussed occasionally at commercial manager level; no evidence was found to suggest use at the higher levels of the organisation.
 - (c) Data on CRRs does not appear to be significant in Network Rail's management processes; for example, there are no internal KPIs on CRRs.

Headquarters

- 5.16.12 Freight business managers responsible for EWS reported 20 live CRRs at year end and 19 submitted during the year. We believe, however, these 19 CRRs were not directly submitted through the CRR process by the customer, but were pre-existing projects brought within the CRR process for control purposes by the account team.
- 5.16.13 Freight business managers responsible for DRS reported 5 live CRRs at year end with no recorded activity in the year. However, we found that four of the listed DRS CRRs have been physically completed but have not been formally signed off by the customer. Network Rail meets with DRS regularly and enhancements however CRRs as such have not been discussed.
- 5.16.14 The Annual Return reports a CRR for ATOC submitted in a previous year. We found this CRR had been withdrawn and subsequently reinstated in the 2003/04 year.

East Anglia Region

- 5.16.15 We found evidence that the account teams in East Anglia Region follow the procedures correctly. The Region currently has responsibility for only three CRRs; the account team noted their customers placed greater emphasis on the LOC process.
- 5.16.16 The two CRRs reported for Anglia (now renamed as "ONE") are likely to be withdrawn; one of these two CRRs is expected to be incorporated into the LOC. The single CRR reported for c2c is a combination of a station renewal and enhancements funded by the operator.

London North Eastern Region

- 5.16.17 GNER is the only customer with active CRRs at the end of the reporting year. We found evidence that the account teams in the Region follow the procedures correctly. However, one of the two CRRs reported for GNER was not recognised in the audit by members of the customer account team responsible for its administration – even though this CRR was correctly entered in the HQ reporting database. This is somewhat perplexing and suggests a failure in the management of the process.
- 5.16.18 The account team noted that CRRs are not significant in their relationships with customers but LOCs are now central to the relationship. In the past, PTEs have been significant users of the CRR process; however, PTEs now direct schemes through the SRA rather than managing them directly with Network Rail.

Scotland Region

- 5.16.19 No new CRRs were submitted in Scotland this year. The account team suggested that this was due to the SRA's refranchising process and SPTE's current focus on major schemes rather than minor improvements. However, we found evidence of the Region using the CRR process insofar as it was required by customers.
- 5.16.20 The account team has also sought to formally sign-off 12 of SPTE's CRRs as 8 of their 15 enhancement CRRs are complete, 3 of their 4 process CRRs are complete and the other process CRR has been withdrawn. Unfortunately sign-off has not been achieved in the reporting year as successive meetings with SPTE have been cancelled by the customer. We expect to see these 12 CRRs shown as signed off in next year's Annual Return.

Southern Region

- 5.16.21 Similar to LNE, we found evidence the account teams were following the procedures but also discovered a CRR (for Eurostar) which has been reported in the Annual Return but was not recognised in the audit by members of the account team. Again, this suggests a failure in the management of the process.
- 5.16.22 A number of the CRRs reviewed had commentaries that were over 12 months old. The customer account team suggested this reflects the interest taken in CRRs by customers.

Confidence grade

- 5.16.23 The process for CRR management is universally applied. We discovered a possible (and unresolved) discrepancy with two CRRs which adversely impacts our assessment of accuracy for this measure. We believe this measure should be given a confidence grade of A2.

Recommendations

- 5.16.24 We recommend CRRs in the HQ reporting database should be reviewed regularly rather than reviewed on an “ad hoc” basis to ensure the commentaries reflect current progress and improve the accuracy of the reporting process; a quarterly review should be adequate.
- 5.16.25 We recommend consideration should be given to expanding the CRR measure to incorporate other processes which demonstrate Network Rail’s responsiveness and achievements in delivering for its customers.
- 5.16.26 We recommend consideration is given to methods of incorporating Network Rail’s achievements from work associated with SRA approved or sponsored enhancements within the Annual Return.

6 Regional summary

6.1 Introduction

- 6.1.1 This section summarises the key findings within each Region audited. The detailed commentary and findings for each of the reported measures is contained in Section 5.
- 6.1.2 In general, except as noted below, we found the Regions well prepared for the audits with a dedicated person responsible for facilitating audits. A full programme of audits was held in each of the Regions, and these were attended, in most cases, by the appropriate personnel. In a few cases, however, the recent reorganisation meant that personnel who had been involved in a measure for the 2003/04 reporting year were not available.
- 6.1.3 At many of the audits it was clear that a considerable effort had been put into reviewing the questions circulated ahead of the audit programme, and collating supporting data. Additional data requests were responded to positively by the Regions and we have received much of information requested.

6.2 East Anglia Region

- 6.2.1 Although we notified the Region of our programme in advance of the audits, we initially encountered a general lack of preparedness. This was due largely to redeployment of a key regulatory reporting staff member under the national restructuring initiative. This initial lack of preparedness was resolved as the audits progressed, but highlighted that reliance upon single individuals can impair effective audit. We suggest that continuity planning for regulatory reporting is implemented in each region.
- 6.2.2 The following key areas of best practice and weakness were identified in East Anglia Region.
- (a) Unexplained delays in the Region are much less than in most other Regions. We believe that this is due to the relatively high number of delay attributors in the Region, proactive data quality management and good communication between Network Rail and train operators.
 - (b) Last summer's hot weather caused clay shrinkage resulting in destabilisation of the track bed and also affected overhead line equipment, particularly at under-bridges or where there are no adjustment weights for tensioning. Subsequently, rail stressing and OLE tensioning have been undertaken to mitigate these failures.
 - (c) East Anglia Region was unable to fully account for its reported rail defect numbers and had lost periodic defect data from its maintainers.
 - (d) The commencement of a new examinations contract and the recent de-merger from Eastern Region has adversely affected the SCMI process in East Anglia Region. It has taken most of the reporting year to resolve these issues. Plans are now fully in place to recruit more examiners and eliminate the current backlog of examinations.
 - (e) In previous years, SICA assessments have been undertaken by external consultants, supported by analysis of the service and safety history for each interlocking using data from FRAME. The reports produced were comprehensive and subject to review by Regional engineers. For the forthcoming year's SICA assessments, East Anglia Region plans to produce similar reports. We support this.
 - (f) We found the condition grades achieved for eight stations had been revised as they were just below a target score set by the HQ champion. The changes made to these inspections were mainly corrections but also incorporated work in progress and an asset which was present but not in use. Whilst these changes had a

negligible effect on the overall score, the selective checking of stations scoring just below a target level is clearly unacceptable.

- (g) The Region provided supporting data that verifies the renewals and maintenance expenditure levels reported in the Annual Return 2003/04. However the Forecast and Actual enhancement expenditure presented in the Annual Return does not reconcile with Regional data. No explanation is provided on the Region's enhancement spend in the Annual Return.

6.3 London North Eastern Region

6.3.1 The audit programme in London North Eastern Region was well organised with some exceptions and the appropriate personnel were available for the programme of audits.

6.3.2 The following key areas of best practice and weakness were identified in London North Eastern Region.

- (a) A TRUST outage in March impacted the reported data for the 2003/04 year. A cable fire in Manchester affected TRUST for York, Sheffield, Newcastle, Peterborough and Kings Cross areas. Systems were restored in 24 hours using indirect back up links except for the Sheffield area, where systems were not fully restored for 4 days due to a fault on the back up link.
- (b) We found that the isolated rail defect numbers were subject to significant data corrections during the reporting year, to compensate for the time lags commonly found in the defect reporting process. We have concerns regarding the extent of these data corrections and their impact on the accuracy of the reported results. We were unable to identify an audit trail or a definitive number of isolated defects for the Region to compare with the Annual Return.
- (c) We found the continuous defect results reported for the M2 measure this year did not include RCF defects classified as 'light'. A sense check of the Regional records discovered that the continuous rail defect figure reported in the Annual Return may under-report by up to 20%. This is a material discrepancy in the reporting of this measure.
- (d) In London North Eastern Region the new examinations contractor for measure M8 has been appointed on a 10-year contract. A major problem during the reporting year was the limited examiner resources inherited by the examinations contractor combined with the small number of SCMI examinations undertaken in previous years.
- (e) The Region is 40% below the target number of SCMI examinations for measure M8. A six-year plan has been agreed between Network Rail and the examinations contractor to achieve an even work load starting in 2004/05. This is not compliant with the ARM procedure as all of the examinations will not have been undertaken by 2006/07.
- (f) LNE Region undertook a review of compliance with the DAG for 2003/04 delays attributed to signalling. Some guidance within the DAG was found to be open to interpretation, with evidence of regular misallocation of delay; also, TRUST records were not updated to reflect further emerging information on root cause. The review delivered a 9% reduction in reported signalling delays for this measure through correct allocation of delay in compliance with the DAG. LNE Region has subsequently developed a set of supplementary guidelines for delay attributors on the correct allocation of delays.
- (g) LNE is the only Region we audit to build a comprehensive renewals programme primarily based on the SICA examinations. We would note that the SICA assessment process are not be exclusively used to identify signalling renewals as one of the key drivers for renewal – technical obsolescence – is not given sufficient weighting in the SICA process to use it exclusively. However, we believe Network

Rail should consider using SICA as the primary source for systematically compiling signalling renewals programmes.

- (h) We found a worrying lack of ownership of the reported station condition results within the Region; we believe this was due to the perception within the Region that the measure was not relevant to the renewals process and the condition grade was based largely on decorative appearance rather than the state of the underlying fabric.
- (i) Due to under-resourcing only 8% of the 204 stations leased by Arriva were subject to a station facility inspection.
- (j) The rail, sleeper and structures renewals volumes presented in the Annual Return do not concur with the Regional data presented at the audit.
- (k) Regional personnel demonstrated a good understanding of the application of the new signalling renewals measure and were able to provide clear and consistent supporting data outlining the calculation of the SEU figure presented in the Annual Return.
- (l) GNER is the only customer in the Region with active Customer Reasonable Requirements at the end of the reporting year. One of the two CRRs reported for GNER was not recognised in the audit by members of the customer account team responsible for its administration – even though this CRR was correctly entered in the HQ reporting database. This suggests a failure in the management of the process.

6.4 Scotland Region

6.4.1 The audit programme in Scotland Region was very well organised. It was clear that there had been significant preparation for most of the audits, with audit trails provided at the meetings for most of the measures.

6.4.2 The following key areas of best practice and weakness were identified in Scotland Region.

- (a) Delay minutes fell by a third in 2003/04 to 0.83 million minutes beating the target. Unexplained train delays were reduced by almost 40%; the Region attributed this to the implementation of a new training package for delay attributors.
- (b) Scotland Region is currently undertaking a series of timetabling initiatives which we should expect to lead to reduced delays next year. This work includes optimisation of the working timetable (WTT) at junctions using the modelling tool Merit and validation of sectional running times for the Fife Circle with ScotRail.
- (c) The corrected number of isolated rail defects between 2002/03 and 2003/04 has increased by 146%. However, these figures include some 5,300 minor visual defects such as blemishes and surface markings. We believe this is a misinterpretation of Network Rail standard RT/CE/S/057 Issue 4. These 5,300 visual defects should not be reported as part of measure M2 as they do not require further action and therefore do not fall within the definition of a reportable defect. This is a material discrepancy in the reporting of this measure
- (d) We found that the Region's interpretation of Network Rail standard RT/CE/S/057 Issue 4 has also led the Region to overstate the length and number of continuous defects reported for M2 this year. The standard requires that sites which are re-railed due to RCF defects should be input to the reporting database and classified as 'light' RCF even though the rails have been replaced; this prompts the maintainers to inspect the site for RCF on the new rails. As these sites are in the reporting database for administrative ease and are not sites with defects, these sites should not be reported for the M2 measure. Unfortunately, these 're-railed ex-RCF sites' have been included in the results for this year. The Region reports a total of 704,457 yards of continuous rail defects at year-end. Our analysis of the

Regional data sources reveals that 23% of this total relates to ex-RCF sites. This is a material discrepancy in the reporting of this measure.

- (e) Scotland Region shows a reduction of nearly 50% for number of TSRs and over 40% for severity score. The Region's Infrastructure Speed Removal Team showed best practice in TSR management.
- (f) Progress in SCMI as reported in the Annual Return was encouraging and by the time of the audits progress was good; the 2003/04 work was complete on site, as was the backlog from previous years, although some data had yet to be run through the SCMI tool and into the database.
- (g) Scotland undertook just three SICA assessments during the year, compared to an internal target of 35. We were informed that this shortfall was due to the re-organisation and insufficient trained assessors.
- (h) We found Scotland undertook only 31 AC traction contact system condition assessments compared with a target of 64. We also found the Region was not compliant with standard RT/O/P/015 on the inspection of plant, even though the Region bundled the M15 inspections with OHL surveillance and end-product checks of contractor's work.
- (i) Scotland is the only Region to have carried out an audit of the station condition inspection data using a 20% sample of inspection reports.
- (j) There are disparities between the rail and sleepers volumes presented in the Annual Return and those presented at audit.
- (k) Improvements to the management and reporting of structures renewals workbanks were implemented during the 2003/04 reporting year to better define and cost the Region's structures renewals activities.

6.5 Southern Region

6.5.1 The audit programme in Southern Region was very well organised. Copies of the reported figures for each measure, the Regional procedures and, in some cases, supporting data were provided ahead of the audit programme.

6.5.2 The following key areas of best practice and weakness were identified in Southern Region.

- (a) Network Rail and South West Trains controllers are now co-located under a unified management structure in the Wessex Integrated Control Centre (ICC) at Waterloo. We observed evident motivation to optimise service delivery to passengers. Controllers reported improved management of incidents due to the availability of decision makers and a non-partisan approach which led to more openness and trust between participants.
- (b) The Region has significantly improved the rail defect reporting process, primarily as a result of the introduction of a new defect reporting system, RADAR, in one of its maintenance areas.
- (c) The number of TSRs on the Region has increased by nearly 30% and severity score has increased by over 80%. Examination of the detailed data revealed more than 50% of the total severity score for Southern Region is associated with just 9 TSRs which form less than 10% of the total number. Of these TSRs, four were related to embankment shrinkage during hot weather.
- (d) Just prior to the M8 audit the examinations contractor realised that a significant amount of data was missing from the SCMI database. Late confirmation of the budget meant only half of the target number of SCMI examinations were undertaken this year.

- (e) Southern undertake a “near 100%” check of signalling delays attributed in TRUST against the root causes recorded in the FRAME fault reporting system within 48 hours of the incident to increase the accuracy of delay attribution.
- (f) 22% of the Region's third rail wear measurements are more than 10 years old. For 2003/04 only one of the three areas in the Region (Kent) provided wear measurements. Just 4% of the third rail within the Region was measured against a target of 10%. The resources allocated to undertake these measurements were redirected by Network Rail due to the low priority of wear measurement.
- (g) Following issues regarding data quality and integrity identified during the 2002/03 reporting year, the Region revised its commercial track renewals reporting processes to promote a higher level of data integrity and reliability.
- (h) The Regional forecast and expenditure figures presented in the Annual Return 2003/04 do not concur with the all the supporting data provided for the reconciliation assessment.
- (i) One of Eurostar's Customer Reasonable Requirements, which has been reported in the Annual Return, was not recognised in the audit by members of the account team. This suggests a failure in the management of the process.

7 Conclusion

- 7.1.1 Network Rail is responsible for preparing the 2004 Annual Return in accordance with its regulatory and statutory obligations using procedures prepared by Network Rail and agreed with Office of Rail Regulation. Our responsibility is to audit the reported data in East Anglia, London North Eastern, Scotland, and Southern Regions and its aggregation into network totals by HQ; we also audit the reported data for two HQ-championed measures.
- 7.1.2 We have audited data in the 2004 Annual Return relating to the performance and condition of assets in the above mentioned Regions; we have also reviewed other disclosures in the 2004 Annual Return relating to other Regions.
- 7.1.3 This report, including opinions, has been prepared for use of Office of Rail Regulation in accordance with the Director Generals' duty and for no other purpose. We do not, in reporting, accept responsibility for any other purpose or to any other person to whom this report is shown. We report our opinion as to whether the 2004 Annual Return gives a representative view and whether the data reported by Network Rail is consistent with that from the above-mentioned Regions.
- 7.1.4 We conducted our audit in accordance with an audit plan. Our audit included examination, on a sample basis, of evidence relevant to the data and disclosures in the 2004 Annual Return. We planned and performed our audit so as to obtain information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance on the validity of data in the 2004 Annual Return from the above mentioned Regions
- 7.1.5 In our opinion the reported information from the above mentioned Regions is a reasonable representation of performance except as noted in our commentaries. Generally, except as noted in our Report, data from the Regions has been properly prepared in accordance with agreed procedures and incorporated into the network totals.
- 7.1.6 Certain data in the 2004 Annual Return is of poor quality and we have noted some systemic shortcomings in the areas of consistency of application of procedures and quality control. We have recommended that the definition of certain measures be reviewed and identified the need to improve certain other data collection and control processes.

8 Appendix A: Timetable for 2003/04 audits

Date	Venue	Audit	Network Rail attendee(s)	Reporting Team attendee(s)
24/05/2004	Network Rail Headquarters, 40 Melton Street, London	Operational Performance	Nigel Salmon, Performance Manager Colin Greenslade, Business Manager, Train Management Systems John Stanley, Regulatory Business team	Simon Pready Peter Symes
24/05/2004	Network Rail Headquarters, 40 Melton Street, London	C1-C4	Matthew Clements, National Engineering Information Analyst Andy Jones, Track Strategy Engineer Ian Bucknall, Route Availability Engineer Jon Stanley, Regulatory Business team	Stephen Varma Bob Collinson Simon Pready
24/05/2004	Network Rail Headquarters, Eversholt Street, London	CRR	Ian Brown Andriana Shiakallis	Bob Heasman
25/05/2004	Network Rail Headquarters, 40 Melton Street, London	M3, M5	John Turner Jon Stanley, Regulatory Business team Ian Croot	Stephen Varma Bob Collinson
25/05/2004	Network Rail Headquarters, 40 Melton Street, London	M11 & M12	Kevin Lydford, Head of Electrification Glenn Wiles, M11/12 Champion John Stanley, Regulatory Reporting team	Simon Pready Bob Care Tony Bishop
25/05/2004	Network Rail Headquarters, 40 Melton Street, London	M13 & M14	Dave McQuillan, M13/14 Champion Glenn Wiles, M15/16 Champion Charles Hervy, Business Planning Engineer E&P	Simon Pready Bob Care Tony Bishop
25/05/2004	Network Rail Headquarters, 40 Melton Street, London	M15 & M16	Dave McQuillan, M13/14 Champion Glenn Wiles Charles Hervy, Business Planning Engineer E&P	Simon Pready Bob Care Tony Bishop
26/05/2004	Network Rail Headquarters, 40 Melton Street, London	M9 & M10	David Marriott, Signalling Engineer Steve Bottom, Regulatory Business Manager	Simon Pready Bob Wyatt
26/05/2004	Network Rail Headquarters, 40 Melton Street, London	M20-M29	Tom Griffiths, National Critical Resources Manager, Robert Oswald, Supply Chain Analyst Jon Stanley, Regulatory Business team	Stephen Varma Duncan Mills
27/05/2004	Network Rail Headquarters, 40 Melton Street, London	Business Plan	Kevin Little Mark Greenfield, Head of Business Planning Varsha Manhas-Sanderson Steve Bottom, Regulatory Business Manager	Stephen Varma Duncan Mills Jon Bateman
28/05/2004	Network Rail Headquarters, 40 Melton Street, London	M1 & M2	Brian Whitney, National Rail Management Engineer Steve Bottom, Regulatory Business Manager	Stephen Varma Bob Collinson
28/05/2004	Network Rail Headquarters, 40 Melton Street, London	M4	Bob Munn, M4 Champion, National Engineering Reporting Manager Chris Vessey, National TSR Analyst	Simon Pready

Date	Venue	Audit	Network Rail attendee(s)	Reporting Team attendee(s)
07/06/2004	Network Rail East Anglia, Eastern House & Tottenham Depot	M1 & M2	Mark Allan, Regional Rail Management Engineer Brian Hadwell, Railflaw Manager	Stephen Varma Bob Collinson
07/06/2004	Network Rail East Anglia, Eastern House, London	M4	Simon Chapman, Engineering Knowledge Manager Alastair Bayliss, Engineering Knowledge Assistant Ian Rush, Engineering Knowledge Manager	Simon Pready
08/06/2004	Network Rail East Anglia, Eastern House, London	Operational Performance	Phil Hudson, Route Performance Manager	Simon Pready Peter Symes
08/06/2004	Network Rail East Anglia, Eastern House, London	M1 & M2	Simon Katz, Reporting Assistant Mark Allan	Stephen Varma
08/06/2004	Network Rail East Anglia, Eastern House, London	C1-C4	Simon Chapman, Regulatory Reporting Co-ordinator Ian Rush, Engineering Knowledge Manager	Stephen Varma
08/06/2004	Network Rail East Anglia, Eastern House, London	CRR	Jonathan Chatfield Andrew Dutton	Bob Heasman
09/06/2004	Network Rail East Anglia, Eastern House, London	M9 & M10	David Jones, Regional Signal Engineer	Simon Pready Bob Wyatt
09/06/2004	Network Rail East Anglia, Eastern House, London	M20-M29	Jeremy Harrison, Investment Projects Controls Manager Steve Longdon, Track Renewals Manager Simon Chapman, Engineering Knowledge Manager Kenneth Gray, Signalling Renewals Engineer Nia Thomas, Track Renewals team	Stephen Varma Duncan Mills
10/06/2004	Network Rail East Anglia, Eastern House, London	M11 & M12	Simon Thick, Regional Electrification Engineer	Simon Pready Tony Bishop
10/06/2004	Network Rail East Anglia, Eastern House, London	M13 & M14	Simon Thick, Regional Electrification Engineer Bob Chattern, Regional Distribution Engineer	Simon Pready Tony Bishop
10/06/2004	Network Rail East Anglia, Eastern House, London	M15 & M16	Simon Thick, Regional Electrification Engineer Cliff Elsey, Regional Electrification Engineer (part) John Brandon, Assistant Are Contact System Engineer Steve Bottom, Regulatory Business Manager (part)	Simon Pready Tony Bishop
10/06/2004	Network Rail East Anglia, Eastern House, London	Business Plan	Andy Tappern, Financial Controller Jason Baker	Stephen Varma Duncan Mills
14/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M20-M27,M29	Richard Stewart, Project Manager – Track Steve Bottom, Regulatory Business Manager David Toner, Project Manager – E&P Cameron Fraser Keith Miller, Project Manager – Investment Structures	Stephen Varma Duncan Mills
15/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M4	Scott Mayle, Assistant Development Manager Mark Kousourou, Engineering Reporting Co-ordinator	Simon Pready

Date	Venue	Audit	Network Rail attendee(s)	Reporting Team attendee(s)
15/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M28	Jim Brown, Project Manager – Earthworks	Stephen Varma Duncan Mills
16/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M11 & M12	Bob McDonald, Regional Engineer Contact Systems	Simon Pready
16/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M13 & M14	Ron Garrett, Regional Electrification Engineer Tommy Dillon, Regional Plant Engineer	Simon Pready Tony Bishop
16/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M15 & M16	Ron Garrett, Regional Electrification Engineer Bob McDonald, Regional Engineer Contact Systems	Simon Pready Tony Bishop
16/06/2004	Network Rail Scotland, Buchanan House, Glasgow	C1-C4	Alasdair Mitchell, Infrastructure Data Analyst	Stephen Varma Bob Collinson
16/06/2004	Network Rail Scotland, Buchanan House, Glasgow	Business Plan	Annette Barnstaple, Business Planning Manager – Investment	Stephen Varma Duncan Mills
17/06/2004	Network Rail Scotland, Buchanan House, Glasgow	Operational Performance	Euan McIntyre, Performance Assurance Manager Anne Marie Harmon, Routes Performance Manager	Simon Pready Peter Symes Jon Bateman
17/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M1 & M2	Archie Crawford, National Track Engineer Mike Tomlinson, Territory Track Management Engineer	Stephen Varma Bob Collinson
17/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M9	Stephen Muirhead, Regional Signal Engineer Euan McIntyre, Regional Performance Assurance Manager	Simon Pready Bob Wyatt Jon Bateman
17/06/2004	Network Rail Scotland, Buchanan House, Glasgow	M10	Stephen Muirhead, Regional Signal Engineer	Bob Wyatt
18/06/2004	Network Rail Scotland, Buchanan House, Glasgow	CRR	Susan Anderson Bill Lynas Jo Noble	Bob Heasman
18/06/2004	Network Rail Scotland, Motherwell Depot	M1 & M2	Archie Crawford Michelle Mullin, Assistant Engineer	Stephen Varma Bob Collinson
21/06/2004	Network Rail Headquarters, 40 Melton Street, London	Operational Performance	Giles Baxter, Regional Performance Manager Angelique Tjen, Regulatory Business Analyst	Simon Pready Peter Symes
21/06/2004	Network Rail Southern, Waterloo offices, London	M1 & M2	Bob Hazell, Regional Track Engineer Dave Gilbert, Regional Track Maintenance Engineer Tony Ramanathan, Engineering Knowledge Manager	Stephen Varma Bob Collinson Michael Jamieson
21/06/2004	Network Rail Southern, AMEC offices, Croydon	M1 & M2	Dave Gilbert	Stephen Varma Bob Collinson
21/06/2004	Network Rail Southern, Waterloo offices, London	M9	Giles Baxter, Regional Performance Manager	Simon Pready Bob Wyatt Peter Symes
22/06/2004	Network Rail Southern, Waterloo offices, London	M11 & M12	Cliff Elsey, Regional Electrification Engineer Marc Alderman, Procedures Manager	Simon Pready Bob Care

Date	Venue	Audit	Network Rail attendee(s)	Reporting Team attendee(s)
22/06/2004	Network Rail Southern, Waterloo offices, London	M13 & M14	Cliff Eisey, Regional Electrification Engineer Marc Alderman, Procedures Manager	Simon Pready Bob Care
22/06/2004	Network Rail Southern, Waterloo offices, London	M15 & M16	Cliff Eisey, Regional Electrification Engineer Marc Alderman, Procedures Manager Mark Proctor, Regional Renewals Engineer	Simon Pready Bob Care
22/06/2004	Network Rail Southern, Waterloo offices, London	M20-M22, M25	Nick Lewis, Programme Manager Track Renewals Tony Ramanathan, Engineering Knowledge Manager	Stephen Varma Duncan Mills
22/06/2004	Network Rail Southern, Waterloo offices, London	M23, M26-M29	Nigel Ricketts Mark Huband Tony Ramanathan, Engineering Knowledge Manager	Stephen Varma Duncan Mills
22/06/2004	Network Rail Southern, Waterloo offices, London	M24	Kevin Bulger Jerry Martin Steve Brown Tony Ramanathan, Engineering Knowledge Manager	Stephen Varma Duncan Mills
23/06/2004	Network Rail Southern, Waterloo offices, London	M4	Kathleen Crisp, Engineering Knowledge Assistant	Simon Pready
23/06/2004	Network Rail Southern, Waterloo offices, London	Business Plan	Jayesh Rama, Business Planning Manager Amalia Pateman, Project Accountant	Stephen Varma Duncan Mills
24/06/2004	Network Rail Southern, Waterloo offices, London	M4	Bob Hazell, Regional Engineer	Simon Pready
24/06/2004	Network Rail Southern, Waterloo offices, London	M10	Mark Brewer, Regional Signal Maintenance Engineer Steve Bottom, Regulatory Business Manager (part) Angelique Tjen, Regulatory Business Analyst (part)	Simon Pready Bob Wyatt
24/06/2004	Network Rail Southern Waterloo offices, London	C1-C3	Bob Hazell Nigel Ricketts	Stephen Varma Duncan Mills
25/06/2004	Network Rail Southern, Waterloo offices, London	CRR	Sarah Williams Melanie Braethwaite Jan Bylanski Jackie Williams Mary Collins Tamsine Leadman	Bob Heasman
28/06/2004	Network Rail LNE, Hudson House, York	Operational Performance	Dan Bushby, Route Performance Analyst Wayne Correy, Route Data Quality Specialist	Simon Pready Peter Symes
28/06/2004	Network Rail LNE, Jarvis House, York	M1 & M2	Kieth Lea, Track Engineer Andrew Beeson, Track Quality Analyst	Stephen Varma Bob Collinson
28/06/2004	Network Rail LNE, Hudson House, York	M9	Alan Kitchen, Regional Signal Engineer	Simon Pready Bob Wyatt
28/06/2004	Network Rail LNE, Hudson House, York	M10	Alan Kitchen, Regional Signal Engineer Steve Gall Regional Signal Renewals Engineer	Simon Pready Bob Wyatt

Date	Venue	Audit	Network Rail attendee(s)	Reporting Team attendee(s)
28/06/2004	Network Rail LNE, Prudential House, York	M20-M22, M25	Peter Stone, Project Commercial Manager	Stephen Varma Duncan Mills
28/06/2004	Network Rail LNE, Tollgate House, York	M23, M26-M29	Phil Bennett, Contracts & Commercial Manager	Stephen Varma Duncan Mills
28/06/2004	Network Rail LNE, Hudson House, York	CRR	Richard Wrightson Simon Coulthard	Bob Heasman
29/06/2004	Network Rail LNE Jarvis House & Hudson House, York	M1 & M2	Andrew Beeson, Track Quality Analyst Chris Lunn, Asset Reporting Manager Steve Bottom, Regulatory Business Manager	Stephen Varma Bob Collinson Jon Bateman
29/06/2004	Network Rail LNE, Hudson House, York	M4	Fasar Zarif, Asset Knowledge Manager Nigel Hewitt, Area Data Maintenance Manager (seconded to TSR Management)	Simon Pready
29/06/2004	Network Rail LNE, Jarvis House, York	Business Plan	Mark Tarry, Financial Controller Russell Hardcastle, Senior Project Accountant Mark Hicks, Project Accountant Steve Bottom, Regulatory Business Manager	Stephen Varma Duncan Mills Michael Jamieson Jon Bateman
30/06/2004	Network Rail LNE, Jarvis House, York	M11 & M12	Bob Pocock, Regional Distribution Engineer	Simon Pready Tony Bishop Robert Williams
30/06/2004	Network Rail LNE, telephone conversation	M11 & M12	Tony Kirkman	Simon Pready
30/06/2004	Network Rail LNE, Jarvis House, York	M13 & M14	Bob Pocock, Regional Distribution Engineer	Simon Pready Tony Bishop Robert Williams
30/06/2004	Network Rail LNE, Jarvis House, York	M15 & M16	Bob Pocock, Regional Distribution Engineer	Simon Pready Tony Bishop Robert Williams
30/06/2004	Network Rail LNE, telephone conversation	M15 & M16	Geoff Norris	Simon Pready
30/06/2004	Network Rail LNE, Prudential House, York	M24	Rod Moorcroft, Contracts and Commercial Manager Tony Smith, Project Commercial Manager – Signalling	Stephen Varma Duncan Mills
30/06/2004	London North Eastern, Hudson House, York	C1-C4	Fazar Zarif, Asset Reporting Manager Dave Dickinson Electrification Engineer Jonathan Bell, Infrastructure Data Analyst	Stephen Varma Duncan Mills

9 Appendix B: OFWAT confidence grading system

9.1.1 This Appendix presents the criteria used for assigning confidence grades which is used in Reporting to OFWAT:

9.1.2 “The [OFWAT] confidence grading system has been established to provide a reasoned basis for undertakers to qualify information in respect to reliability and accuracy. It is essential that proper care and a high level of application is given by the [Water] Company and its Reporter to the assignment of confidence grades to data requiring such annexation. A quality-assured approach should be employed in the methodology used to assign confidence grades, particularly if sampling techniques are in place.

9.1.3 The confidence grade combines elements of reliability and accuracy, for example:

- (a) A2: Data based on sound records etc. (A, highly reliable) and estimated to be within +/- 5% (accuracy band 2);
- (b) C4: Data based on extrapolation from a limited sample (C, unreliable) and estimated to be within +/- 25% (accuracy band 4);
- (c) AX: Data based on sound records etc. (A, highly reliable) but value too small to calculate meaningful accuracy percentage.

9.1.4 Reliability and accuracy bands are shown in the tables below.

Reliability Band	Description
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment.
B	As A but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation.
C	Extrapolation from limited sample for which Grade A or B data is available.
D	Unconfirmed verbal reports, cursory inspections or analysis.

Accuracy Band	Accuracy to or within +/-	but outside +/-
1	1%	-
2	5%	1%
3	10%	5%
4	25%	10%
5	50%	25%
6	100%	50%
X	accuracy outside +/- 100 %, small numbers or otherwise incompatible (see table below)	

9.1.5 Certain reliability and accuracy band combinations are considered to be incompatible and these are blocked out in the table below.

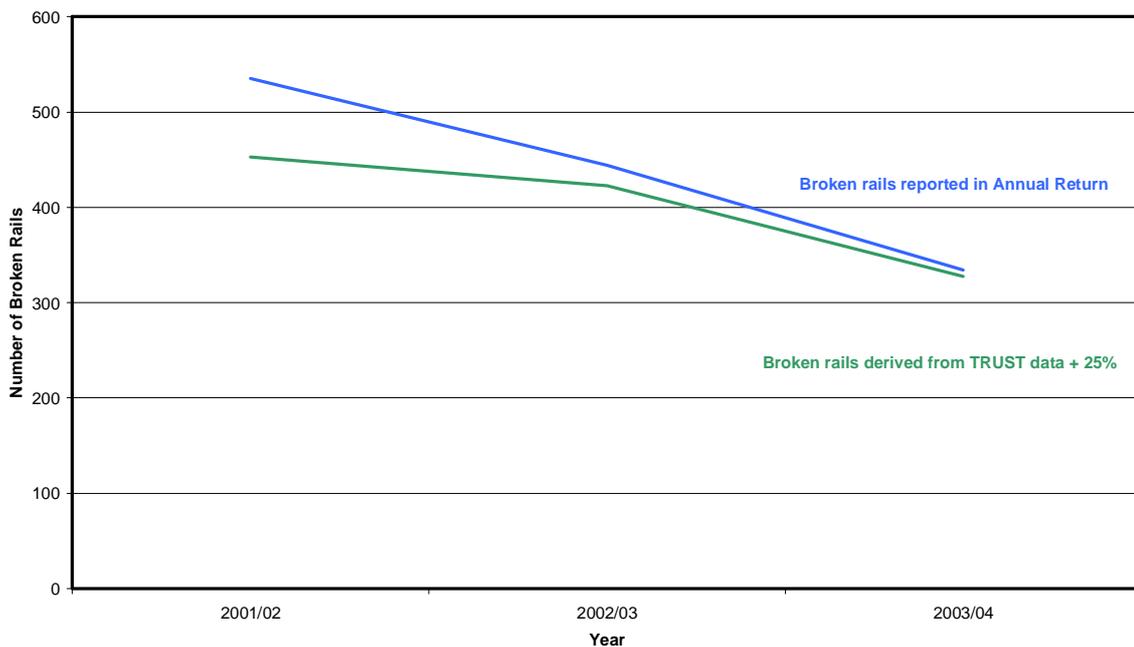
Compatible Confidence Grades				
Accuracy Band	Reliability Band			
	A	B	C	D
1	A1			
2	A2	B2	C2	
3	A3	B3	C3	D3
4	A4	B4	C4	D4
5			C5	D5
6				D6
X	AX	BX	CX	DX

- 9.1.6 Systems for the acquisition, collation and presentation of regulatory data are expected to have reached an advanced level of development. In most cases, a confidence grade of A2, A3, B2 or better is expected. Where confidence grades are below these levels, companies should report on their action plans for improvement in the commentary for the table concerned. They should justify in their reports where action plans are limited to the achievement of A4, B3, B4 or C2 levels.
- 9.1.7 Any deterioration in confidence grades from those reported in the previous Annual Return should be explained together with the action plan for improvement as appropriate.
- 9.1.8 Reports on action plans should include the projected confidence grades, but confidence grades entered in the tables should reflect the current status of the data and not the future status it is intended to achieve.
- 9.1.9 All confidence grades reported should be commented on by the Reporter (or, as appropriate, the Auditor). In each case, they are required to state whether they agree with the confidence grading and if not, provide their opinion. Reporters should also comment on any deterioration, the reason provided by the company, and either the action plan for improvement or justification for limited achievement as noted above. Where there is disagreement between the parties, the Director will normally use the Reporter's assessment of the confidence grade."

10 Appendix C: Analysis of delays caused by broken rails and other track faults (delay category 104B)

- 10.1.1 We analysed TRUST delay data between 2001/02 and 2003/04 to further investigate the relationship between broken rails and delay minutes. We would expect the number of broken rails recorded in the Annual Return to have the same trend as those identified in the TRUST data.
- 10.1.2 The relevant TRUST delay code (IR) is not specific to delay from broken rails but contains delay due to 'broken/ cracked/ twisted/ buckled/ flawed rail'. To extract delay solely due to broken rails, we examined the 'free form' text fields entered in TRUST to determine whether it was associated with a broken rail.
- 10.1.3 Our analysis shows that during 2003/04 a total of 262 incidents in TRUST have a free text field referring to a broken rail. The total number of broken rails reported for 2003/04 is 334 which suggests that this methodology understates broken rails by around 25%. We repeated this analysis for 2001/02 and 2002/03.
- 10.1.4 Our results are presented in Figure 11.1.1. The trend for broken rails reported in the annual return and broken rails derived from TRUST data are consistent, showing a steady reduction over the past three years.

Comparison of Broken Rails Recorded in Annual Return and Broken Rails Identified in TRUST Data



- 10.1.5 Using a correction factor of 1.25 to account for our methodology, we found an average of just 15% of delay minutes attributed to delay category 104B were due to broken rails. This is a small percentage of total delay within this delay code.
- 10.1.6 Total delays for delay category 104B have increased from 5,685 in 2001/02 to 6,207 in 2002/03 and 7,204 in 2003/04. The average delay for these incidents has not changed significantly during this period, remaining at between 155 and 165 minutes per incident. This appears to contradict Network Rail Headquarter's assertion that the increase in delay minutes in this category is due to 'engineering-led' decisions to impose TSRs which result in greater delay minutes per incident.

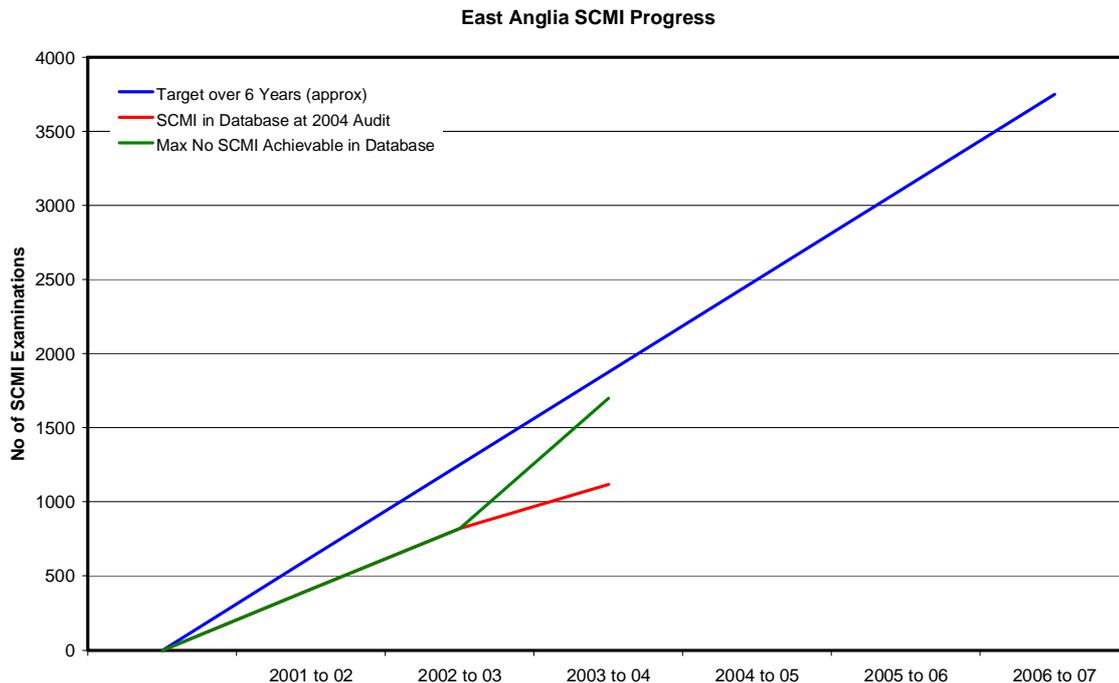
- 10.1.7 We can conclude that the increase in delay minutes is due to an increase in the number of 'other track fault' delay incidents recorded. As we would expect the delay minutes associated with broken rails have fallen as the number of broken rails has reduced, however the same relationship is not evident between rail defects and the 'other track fault' delay category.
- 10.1.8 As noted in our report on measure M2 (rail defects) the reporting of the rail defect figures during the reporting year has suffered from an inconsistency in the application of standards between Regions and this might provide an explanation for this inconsistency.

11 Appendix D: Detailed findings of structures condition audits (M8)

Detailed Findings

East Anglia Region

- 11.1.1 In East Anglia Region a new Examinations Contractor was appointed on a 10 year contract in April 2003. Prior to this another company had held a 2 year examination contract.
- 11.1.2 The start-up of the new contract impacted upon the number of SCMI assessments undertaken during the reporting year. This was due to the following reasons:
- The examiners were transferred by the TUPE process from the previous contractor. The number and status of the examiners was unknown until the day of transfer;
 - The management of the contract was initially from York as, when the contract was let, a single contract covered the then Eastern Region. At the start of the year the management of the contract was split between East Anglia and LNE Regions.
 - Work requiring possessions did not start until Autumn 2003 as the possessions had not been booked.
- 11.1.3 The figure below shows progress on SCMI assessments as they were at the time of the audit.



- 11.1.4 The target has been derived from the total number of bridges to be subject to SCMI in the 6 year period starting in April 2001 as reported in our 2002 audit. It has been assumed that the SCMI assessments will be split equally across the years. While this will not entirely reflect the assessment programme it provides a good indicator of progress to date.
- 11.1.5 878 SCMI examinations were due in 2003/04. This included around 200 additional examinations carried over from previous years. 34 examinations from 2003/04 were reported out of a total of 336.

- 11.1.6 At the time of the audit 640 SCMI examinations had been carried out. The contractor has a resourced plan in place to complete the 2003-04 year's work and the 2004-05 year's work by the end of the 2004-05 year.

Data Management

- 11.1.7 During the audit of Network Rail a number of duplicate entries in the SCMI database were identified. Most of the duplicate entries were arches with slightly different notation used in the two entries. There were also other notational errors requiring amendment. Following the audit, Network Rail carried out a reconciliation to identify these and remove them from the database. The number of entries in the database fell from 1,177 to 1,118, a fall of 5%.
- 11.1.8 During the audit of the Examinations Contractor the auditor selected sample structures from the master schedule of examinations and requested that the examination report be retrieved from the files and the SCMI score be identified in the database. In 2 out of 3 cases the SCMI entry could not be found in the database.

Accuracy and Review

- 11.1.9 No site audits were undertaken by Network Rail during the reporting year. A cursory review of the examination report prior to sign-off in undertaken by Network Rail.
- 11.1.10 The examinations contractor in the Region has started to introduce technical checks at the start of 2004/05. It is intended that 12 reports from each examiner in the year will be reviewed and four site audits will be undertaken with the examiner present to re-mark the structure. It is acknowledged that these initiatives will have only a small influence on 2003-04 work
- 11.1.11 The auditor welcomes the introduction of the technical audits by the contractor and recommends that Network Rail introduce a programme of site visit audits.

Resourcing

- 11.1.12 The Network Rail Structures Maintenance Team of 8 had the following vacancies for the whole of 2003-04.
- (a) One Structures Maintenance Engineer,
 - (b) One Assistant Structures Maintenance Engineer,
 - (c) The Technical Clerk.
- 11.1.13 For around half of the year the post of Assistant Structures Maintenance Engineer and Trainee Structures Engineer were also vacant. Also, after the de-merger of the East Anglia and LNE examination contracts during 2003-04, a contract administration team was created to manage the East Anglia Examinations Contract, but has not yet been adequately resourced.
- 11.1.14 The high number of vacancies had a significant effect on Network Rail's ability to manage the SCMI work load.
- 11.1.15 At the examinations contractor establishment of the project team took up a considerable part of 2003-04. The contractor stated that the size of the organisation was too small to handle the 2003-04 workload, even if there had not been a late start up. Around 13 to 14 examiners are required compared to the present 10. Training is currently underway to increase numbers so as to recover the present backlog by the end of 2004-05.

Procedures

- 11.1.16 Within Network Rail there are no East Anglia Regional procedures that record in writing what the processes are for structure examinations and SCMI, and who is responsible for each stage. The auditor recommended that they should be created so that everyone involved is aware of the processes and peoples' responsibilities.
- 11.1.17 The examinations contractor had basic guidance notes and a process map for the examinations process which could form the starting point for a procedure for the examinations. The auditor recommended that these should be worked up into a formal document and the auditor made suggestions about the format.

Training, Competence and Competence Management System

- 11.1.18 As at last year's audit, there was no competence management system meeting the basic requirements of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001, in place at Network Rail. We recommend that one should be created as a priority.
- 11.1.19 At Network Rail, those dealing directly with SCMI and examination reports, ie the RSME and SME, hold appropriate competence (Unit 1 of RT/CE/S/047) and have undertaken relevant SCMI training. The audit found that the RSE had not yet undertaken unit 1 and this should be arranged if he is to continue in this role. The ASMEs posts were vacant at the time of the audit. We have previously identified the issue that Unit 1 does not always align with the ASME's responsibilities. We again recommend that consideration should be given to an alternative unit.
- 11.1.20 The examinations contractor had a clear view of what training was appropriate for their personnel, but it was not recorded in a training plan. Appropriate training had been completed. For competency assessments there was also a clear view of the appropriate competencies required. Currently the contractor is working through a programme to assess all the examiners to units 5, 9 and 10 using their own assessors. This started in May 2004 and is due for completion by July 2004. The examiners were inherited from the previous contractor without any certificates of competency. The audit found that Unit 2 competence was held by those in the role of Examining Engineer.
- 11.1.21 A summary of competencies held and the assessment programme for the examiners was reviewed at the audit, but this is not yet a competency management system. We recommended that this should be extended to the examining engineers, the underwater examinations subcontractor and amalgamated with training details and strategy to meet the basic competency management system to paragraph 5.1 of RT/CE/S/047, "Standards of Competence for Examination of Structures", Issue 2, February 2001.
- 11.1.22 The audit identified that subcontractors currently used for some examinations have been overlooked in the examinations contractor check for appropriate training and competency for the tasks they do. This should be rectified.

Overall

- 11.1.23 The recent de-merger of Eastern Region has adversely affected the SCMI process in East Anglia Region.
- 11.1.24 As at our two previous audits in this Region there was a serious shortage of personnel in the Network Rail bridge maintenance team. The reorganisation in April 2003 had established a realistic sized team but this had not been resourced. Throughout 2003-04 there was a serious shortage of personnel, leaving insufficient personnel to manage a demanding workload.
- 11.1.25 It was clear that the personnel had prioritised the work to process examinations and deal with safety critical work. However this left establishing documented systems, reviewing SCMI and site audits of the contractors work in SCMI as lower priority work, which has suffered badly during 2003-04. The problems caused have been further compounded by the inadequate resources allocated to the administration team for the East Anglia examinations contract.
- 11.1.26 At the examinations contractor the start up in April 2003 and the inheritance of personnel from the previous contractor had been slow. This was compounded by changing of plans to administer both the LNE part and the East Anglia parts from York, to have a separate set up for the East Anglia contract. This had delayed the establishment of a proper administrative set up for the contract until mid way through the 2003-04 year.
- 11.1.27 It has taken most of the reporting year to resolve these issues.
- 11.1.28 Within the examinations contractor we found that there was a positive attitude to the examinations and SCMI workload. Plans were in place to fully instigate procedures and systems and recruit more examiners. A recovery plan is in place to eliminate the current backlog of examinations. The new 'cost plus' method of payment, appears to have had a beneficial effect on the work achieved.

11.1.29 The examinations contractor estimates that it will take to the end of 2004/05 to clear the 2003-04 backlog and complete the 2004/05 work. Technical checking had been introduced and a programme to audit all of the examiners in SCMI was about to start. There were encouraging signs in the transfer of knowledge to the examiners via the examiner briefings. There is still quite a long way to go and some of these efforts will have had only a small effect of what was done in SCMI in the 2003-04 year.

London North Eastern Region (LNE)

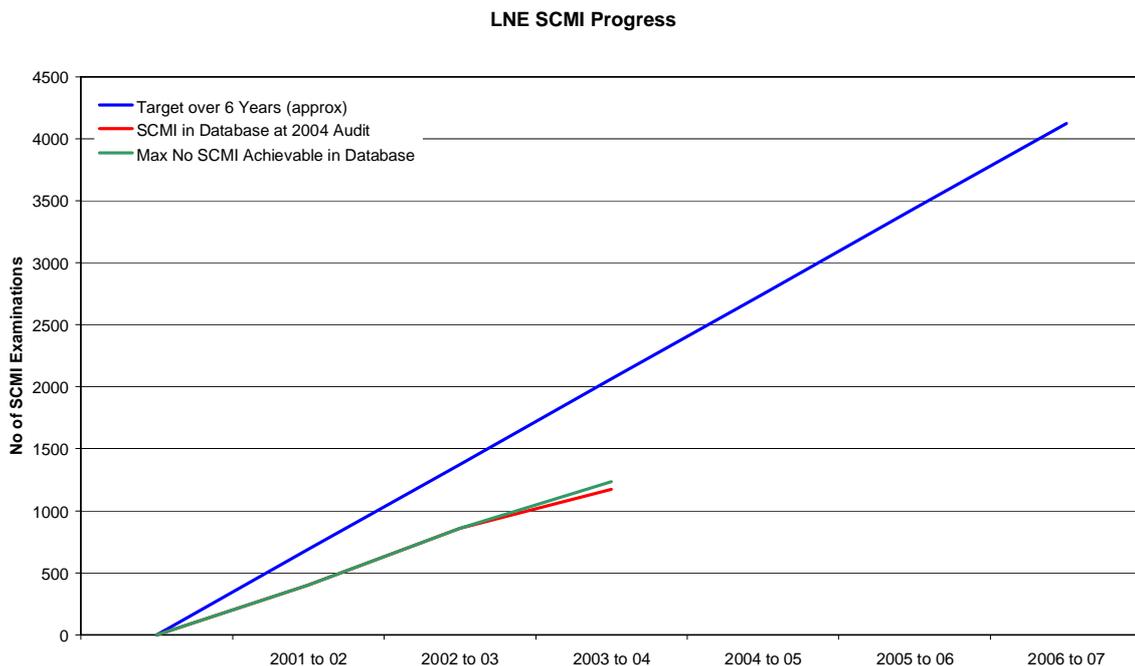
11.1.30 In East Anglia Region a new Examinations Contractor was appointed on a 10 year contract in April 2003. Prior to this another company had held a 2 year examination contract.

11.1.31 The examiner resources, inherited by the TUPE process from the previous contractor, had a significant influence on what could be achieved in examinations and SCMI in the Region in 2003-04.

- (a) The numbers transferring were not known until the date of the transfer.
- (b) The intended task list for 2003-04 was too large for the available examination resources.

11.1.32 Network Rail and the examinations contractor derived a workable task list which matched available resources. This revised list had approximately 900 detailed examinations with SCMI, which was around 40% of the original target number of detailed examinations. The revised list required 378 SCMI examinations.

11.1.33 The figure below shows progress on SCMI assessments as they were at the time of the audit.



11.1.34 The target has been derived from the total number of bridges to be subject to SCMI in the 6 year period starting in April 2001 as reported in our 2002 audit. It has been assumed that the SCMI assessments will be split equally across the years. While this will not entirely reflect the assessment programme it provides a good indicator of progress to date.

11.1.35 A total of 1,237 audits will be recorded in the database once all of the 378 undertaken in 2003/04 have been entered. This contrasts to the 152 SCMI examinations reported in the annual return which reflected the position of the SCMI database in early April.

- 11.1.36 The total of 1,237 is significantly below the number required to meet the target to examine all assets within 6 years.

Data Management

- 11.1.37 During the audit at Network Rail, a sample of 4 signed off examination reports were cross checked against both the SCMI database and the LNE SAD database. All of the data correlated.
- 11.1.38 At the examination contractor six structures which had a detailed exam and SCMI in 2003-04 that had been reported to Network Rail were selected from the work bank. The paper exam report copy retained by the examination contractor was checked for
- (a) Sign off by the Examining Engineer,
 - (b) Date of entry to Geogis,
 - (c) Engineer's report summary sheet,
 - (d) Repair recommendations,
 - (e) SCMI sketches, and,
 - (f) Scoring sheets.
- 11.1.39 The checks were successful except for one structure where the paper copy was not signed off, paper SCMI details were not attached and the database had not recorded sign off by the examining engineer. The contractor should check to ensure that this is only an isolated incident and is not a result of more widespread deviation from the process.
- 11.1.40 In previous audits, the handling of electronic data received by Network Rail and processed through the tool was reviewed and we concluded that the process was generally well controlled. During this audit we requested both the 152 items of SCMI data in the Annual Return and the 241 items which made up the total in the Region's signed off return dated 7th June 2004. The 152 were located but the 241 could not be identified as further entries had been made to the SCMI database since and only back up/record copies of the full database are made. The auditor recommended that record copies of the data base should be taken when data status is reported and at other significant points so that back tracking can be carried out with ease.

Accuracy and Review

- 11.1.41 Network Rail undertakes the following checks on the SCMI process.
- (a) SCMI is reviewed briefly by Network Rail's SME during the evaluation of the examination report.
 - (b) End product checks are required on 1% of each SME's examinations, of which half are currently required to be on SCMI structures where the score is less than 60. Around 15 SCMI reports per SME per year are checked further in this end product check process.
 - (c) The SME reviews all SCMI scores of 30 or below and 95 or above.
- 11.1.42 The auditor noted that Network Rail audited the operations of the examinations contractor in late 2003 using a Network Rail audit protocol. The audits included a selective review of SCMI sketches and scoring on site. On SCMI the audits found labelling errors, but scoring checks were better than had been expected. No formal observations were made and no non-conformity reports were issued.
- 11.1.43 The auditor recommended that a programme of site audits should be put in place by Network Rail to cover all of the examiners. This was acknowledged by Network Rail but they stated that the time and manpower required for such audits is significant. SCMI is not safety related and such audits would have to be prioritised with safety related tasks.

- 11.1.44 A review of each SCMI report is carried out by the examination contractor's Examining Engineer. This uses the photographs of the report as a reference. The emphasis is inevitably on major defects because minor ones are difficult to spot from photographs. A reassuring familiarity with SCMI and the ability to quickly spot errors was noted during the audit. It is unlikely that this check can achieve much more and the auditor suggested doing more should be in the form of site audits recommended below.
- 11.1.45 The examinations contractor commenced a programme of site audits in late 2003. These then ceased because of the focus on getting examiners through competency assessments to meet a temporary non compliance granted by Network Rail HQ in respect of examiners competency assessments to be completed by 31st March 2004.
- 11.1.46 The site audits had only restarted shortly before our audit. The programme aims to audit each examiner once per year with the examiner present at the audit. The audit appeared to be fairly thorough and the contractor considered it to be a detailed audit.
- 11.1.47 The auditor recommended that these audits are continued and emphasis is placed on reviewing every line of the SCMI scoring sheet. The examinations contractor is at a disadvantage with the audits on SCMI because they do not have access to the SCMI tool or the database. They require a copy of the tool to be able to run SCMI through as required and should be supplied with a copy of the developing SCMI database each period for reference.
- 11.1.48 Network Rail in LNE is not represented on the SCMI user group and they do not feel part of it. This is regrettable as they are responsible for management of the SCMI database. Steps should be taken to copy all past and future correspondence about the user group to them and invite them to participate in meetings.

Resourcing

- 11.1.49 The Network Rail Structures Maintenance team of 11 had the following vacancies during the reporting year.
- (a) One of five Structures Maintenance Engineers for the whole of the year
 - (b) Both Assistants SMEs for the last half of the year
 - (c) The technical clerk post was vacant 3 days out of 5
 - (d) The Trainee Structures Engineer remained vacant and was subsequently frozen.
- 11.1.50 Posts that became vacant during the year were not filled because of a ban on recruitment pending a reorganisation.
- 11.1.51 Following the reorganisation of 24 May 2004, an enlarged team, which assumes responsibility for some of the area previously part of Midlands Region, has 4 out of the 5 Area SME posts vacant. Recruitment is not underway yet pending approval to proceed.
- 11.1.52 Network Rail LNE was inadequately resourced in 2003/04 and it seems likely to remain so a significant way into 2004-05. This is a significant obstacle in effectively tackling a demanding workload.
- 11.1.53 The size of the team of examiners inherited by the examinations contractor was inadequate for the intended examinations workload in 2003/04 and this resulted in a much reduced programme of work being devised to match the resources available. The contractor has increased the size of the team since, although it still has some vacancies.
- 11.1.54 A resourcing plan has been agreed with Network Rail for the next 6 years, to match the intended programme of examinations that will result in detailed examinations of assets every six years. Authorisation by Network Rail to the examinations contractor to recruit examinations contract personnel is awaited.

Procedures

- 11.1.55 Network Rail has a procedure in place with the title "Structures - Concept to Completion" dated November 2001. This was reviewed at a previous audit. Redrafting to incorporate the auditor's comments last year and other items started in September 2003 and it has been issued for comment. The impending reorganisation of Network Rail, which was pending from late 2003 until May 2004, has delayed this. A revised version should be issued as soon as possible.
- 11.1.56 The examinations contractor had a set of comprehensive guidance notes for examiners within their quality plan, with an issue sheet recording who it had been issued to. There was not a procedure/guidance note/process describing the whole examination process from work bank to submitting the completed report and data to Network Rail. We recommended that one was created.

Training Competence and Competence Management System

- 11.1.57 Appropriate competence (Unit 1 of RT/CE/S/047) and training was held by those in the Network Rail Structures Maintenance Team dealing with examinations and SCMI in 2003-04. Some further assessments will need to be carried out as a result of the new appointments and organisation from 24 May 2004.
- 11.1.58 The examinations contractor has the capability to do much of their training in house. Competency assessments for the majority of personnel had been carried out by the time of our audit and there was a programme in place for any yet to be done. During 2003/04 all examiners were put through Units 5, 9 and 10 followed by Examining Engineers and deputies in March and April 2004. Training was appropriate with the examinations contractor carrying out much training in house.
- 11.1.59 At Network Rail there was a Competence Management System in place. In our opinion this fulfils the requirements of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001.
- 11.1.60 At the examinations contractor there was a Competence Management System in place, developed through the year, which states appropriate competence for particular jobs and holds a record of competencies held and expiry dates. In our opinion this fulfils the requirements of RT/CE/S/047 on competency provided that a minor addition, referred to in the recommendations section, is made. The system should also have the appropriate training included for individuals, where they require training, but not necessarily a formal competence assessment to RT/CE/S/047. If these minor modifications are made then, in our opinion, the system will meet the requirements of RT/CE/S/047 for a documented Competence Management System.

Overall

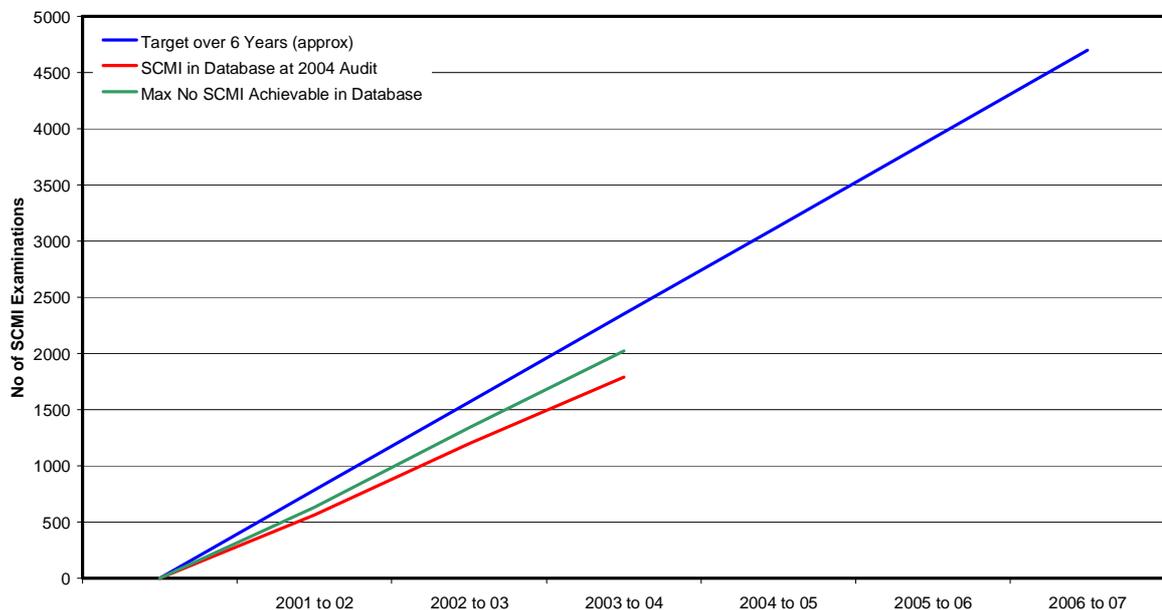
- 11.1.61 In London North Eastern a major problem was the limited examiner resources inherited by the examinations contractor, together with a large task list at the beginning of 2003-04. Carry-overs from poor performance against the targets in previous years had contributed to a list that was physically unachievable with the examination resources available. The problem was tackled by significantly reducing the number of examinations to be done in the year.
- 11.1.62 The problem has been managed this year by a flexible approach agreed with HMRI, whereby compliance will be achieved on examination dates by the end of 2006-07, which matches the examinations contractors' resources but does not even out the workload across all years. Ultimately there is six year plan agreed to achieve an even work load starting in 2004-05.
- 11.1.63 In effect some exams have been and will be deferred and it will be somewhat after the end of the six-year period from start of SCMI in April 2001 before all of the bridges destined for SCMI will have SCMI data entered into the database for the first time.
- 11.1.64 Although deferring examinations is not the preferred solution it is clear that a difficult situation has been managed jointly by Network Rail LNE and the examinations contractor.

- 11.1.65 There were unfilled posts within the Network Rail team throughout the year and posts that became vacant during the year were not filled because of a recruitment freeze pending a reorganisation. This left the team unable to effectively tackle those measures that contribute to improving the accuracy of SCMI, ie by undertaking checks and audits on the work out on site, because safety critical work is (rightly) given a higher priority than any SCMI related matter.
- 11.1.66 The examinations contractor had a slow start to the year, caused by the inheritance of the examining team from the previous contractor and the delay in the establishment of a realistic task list until 4 months into the year. However there was a positive attitude to the examinations tasks and SCMI and a lot had been achieved in setting the project up properly to tackle the workload; setting up processes, arranging competency assessments, putting a competency management system in place, establishing an SCMI checking and audit process as examples.
- 11.1.67 Technical briefings of the examiners by the office engineering and project management teams take place every three months. These include SCMI and examinations. In our opinion these are a welcome development.

Scotland Region

- 11.1.68 In Scotland Region the examinations contractor started a 10 year contract in April 2003. The same examinations contractor held the previous 2 year contract therefore there was much less disruption than in other Regions where the contract had been transferred from one contractor to another.
- 11.1.69 The figure below shows progress on SCMI assessments as they were at the time of the audit.

Scotland SCMI Progress



- 11.1.70 The target has been derived from the total number of bridges to be subject to SCMI in the 6 year period starting in April 2001 as reported in our 2002 audit. It has been assumed that the SCMI assessments will be split equally across the years. While this will not entirely reflect the assessment programme it provides a good indicator of progress to date.

- 11.1.71 A total of 2,026 audits will be recorded in the database once all of the examinations undertaken in 2003/04 have been entered. At the time of our audit Scotland Region was in a good position, having completed all SCMI examinations on site for earlier years and with only 2 not yet examined from 2003-04.
- 11.1.72 Carry over to the following year has largely been avoided. This has been achieved partly by rescheduling examinations within the year and by an increase of resources at the examinations contractor. The increase of resources was in anticipation of extension of SCMI to further groups of structures in 2003-04 but which did not materialise.
- 11.1.73 At the time of our audits SCMI data entries for 2001-02 stood at 562 out of 630, and those for 2002-03 at 636 out of 708. Entries for 2003-04 were 591 out of 688.
- 11.1.74 The Annual Return reported 750 SCMI scores for Scotland for 2003-04. 591 came from the workload of the 2003-04 year. 146 had examination dates from 2002-03 and 13 had examination dates from 2001-02.
- 11.1.75 The total of 2,026 is 14% less than the number required to meet the target to examine all assets within 6 years.

Data Management

- 11.1.76 During our audit we found that changes were made to examination reports and SCMI, if required, in the office after the examination report has been locked down by the examiner. This was done by defeating the electronic lock.
- 11.1.77 Network Rail view what is done as acceptable because the corrections are minor and are discussed with the examiner by telephone. The involvement of the examiner is noted but in our opinion if the examiner locks a report then it should be clear that subsequent changes were made by the office; with the current method any changes made in the office would appear to have been made by the examiner.

Accuracy and Review

- 11.1.78 Network Rail undertake a high level check on the sketches and labelling of each examination report. SCMI is not checked further provided that it runs satisfactorily through the SCMI tool and imports satisfactorily to the database.
- 11.1.79 Site audit visits on SCMI have not been undertaken by Network Rail during 2003-04. It was noted that it was in personnel objectives for implementation. This was primarily due to the following.
- (a) The high number of vacancies.
 - (b) All available time over several months was occupied on responding to an HMRI improvement notice in respect for backlog of examination reports to be signed off and appropriate works recommended.
- 11.1.80 The examinations contractor has in place an office based checking process covering element labelling, sketching and scoring using the detailed examination report as a reference. Reports are returned to the examiner if required.
- 11.1.81 The examinations contractor does not carry out site based audits of SCMI.
- 11.1.82 The examination contractor holds quarterly safety briefings to disseminate information, including SCMI to the bridge examiners. These are supplemented by Area Manager briefings.
- 11.1.83 To assist the examinations contractor in their audits it would be beneficial if they were provided with a formal copy of the SCMI tool and also regular downloads from the SCMI database that is maintained by Network Rail.

Resourcing

- 11.1.84 The Network Rail Structure Maintenance Team of 8 had 3 vacancies throughout the year. Additionally the Regional Structures Maintenance Engineer post became vacant early in the year due to a policy of reduction of Agency personnel. A replacement was not recruited. The team was not large enough to adequately cope with all of the examinations work including SCMI in 2003-04 because of these vacancies.

- 11.1.85 At the examinations contractor the team structure was similar to the earlier 2 year contract. During the year resources were increased in anticipation of the extension of SCMI to further groups of structures in 2003/04. This did not take place. The clearance of the backlog from previous years and with the 2003/04 SCMI examinations almost complete indicates that the team size is satisfactory.

Procedures

- 11.1.86 At Network Rail, there are no Scotland Regional procedures that record in writing what the processes are for structure examinations and SCMI and who is responsible for each stage. The auditor recommended that they should be created.
- 11.1.87 The examination contractor's "Scottish Structures Examination Project, Project Specific Process", Issue 1 dated 10 March 2004 was viewed. This version is a revision of that reviewed in previous audits. Previously it was found to be a suitable procedure to cover the examinations process but two modifications are required as listed in the recommendations section. Also the procedure should be more readily available as during the audit there was some doubt as to exactly where it was stored.

Training Competence and Competence Management System

- 11.1.88 Appropriate competence (Unit 1 of RT/CE/S/047) and training was held by those in the Structures Maintenance Team dealing with examinations and SCMI in 2003-04. The Network Rail Competency Record was reviewed. This had a spreadsheet of names, unit(s) held, date of assessment and required date of reassessment.
- 11.1.89 The auditor recommended that an additional sheet or sheets should be added to:
- (a) Describe briefly that the system is a competency management system to clause 5 of RT/CE/S/047;
 - (b) Describe what units of competence are applicable to appropriate team positions;
 - (c) Make clear who is responsible for maintaining the system.
- The auditor also recommended that training records, where appropriate, should be kept in the same system in a similar format to the competency records.
- If the recommended changes are made the basic requirements of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001 will be met.
- 11.1.90 Within the examinations contractor the team had the appropriate units of competency assessments and/or training.
- 11.1.91 The competency management system comprised two spreadsheets of personnel names with units held, dates of assessment and dates of reassessment. There were two spreadsheets because personnel came from two business groups.
- 11.1.92 We recommended that:
- (a) The two sheets should be brought together into one spreadsheet for all of the examination contract personnel;
 - (b) The data should be brought up to date as there were some entries missing;
 - (c) A cover sheet should be added which states the policy of competency assessment, ie what competence is appropriate to any particular job;
- 11.1.93 We also recommended that training, and in particular SCMI training, where a competency assessment does not automatically follow for all personnel, should be recorded in a similar manner to competency records.
- 11.1.94 If the recommended changes are made the basic requirements of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001 for a documented competency management system will be met.

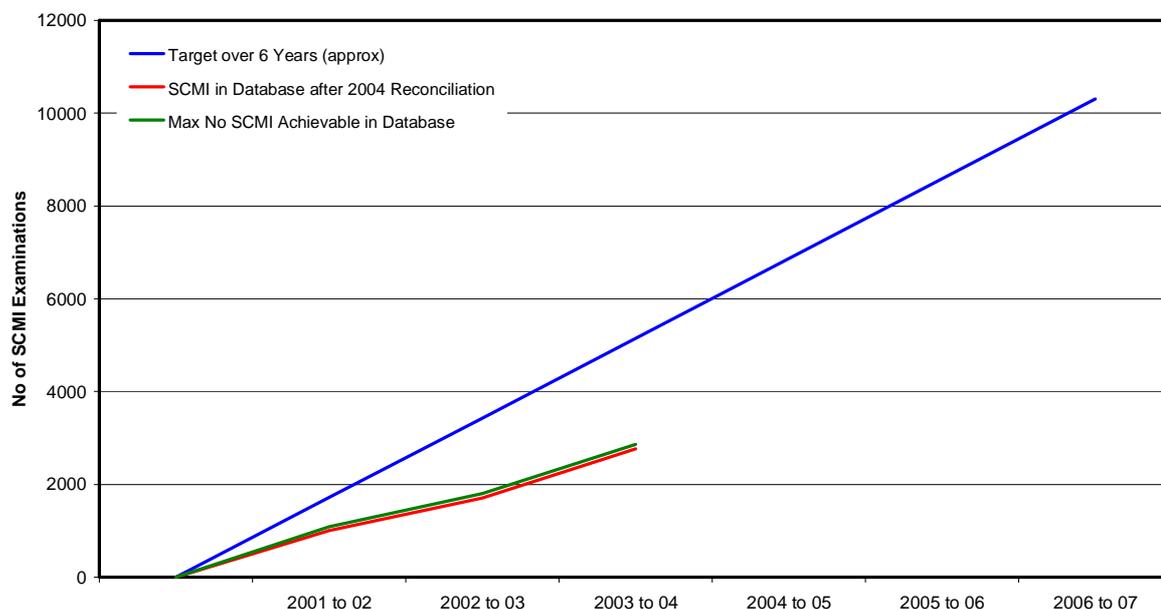
Overall

- 11.1.95 The examinations contractor continued their role in Scotland with a new ten year contract from April 2003. The Region did not have the significant start up issues experienced in East Anglia and LNE.
- 11.1.96 Basic procedures and systems for the examination process were in place at the examinations contractor, but with some revisions and updating required. Improvements had been made at Network Rail since last year, although there was still a significant way to go.
- 11.1.97 Progress in SCMI as reported in the Annual Return was encouraging and by the time of the audits progress was very good; the 2003-04 work was complete on site, as was the backlog from previous years, although some data had yet to be run through the SCMI tool and into the database.
- 11.1.98 There was a serious shortage of personnel in the Network Rail bridge maintenance team throughout the 2003-04 year. The team structures set up from April 2003 had established a realistic sized team but this had not been resourced.
- 11.1.99 It was clear that the personnel had prioritised the work to process examinations and deal with safety critical work. However this left establishing documented systems, reviewing SCMI and site audits of the contractors work in SCMI as lower priority work, which has not had the attention it required during 2003-04.
- 11.1.100 We recommended that both Network Rail and the examinations contractor should visit sites regularly to audit SCMI on structures, seeking to check sketches and all the marking and to feedback to the examiner, ideally with the examiner present. Our recommendation is based on such audits being the only real regular check on what level of accuracy is being achieved in the SCMI work.

Southern Region

- 11.1.101 In Southern Region the examinations contractor started a 10 year contract in April 2003. The same examinations contractor held the previous 2 year contract therefore there was much less disruption than in other Regions where the contract had been transferred from one contractor to another.
- 11.1.102 The figure below shows progress on SCMI assessments as they were at the time of the audit.

Southern SCMI Progress



- 11.1.103 The target has been derived from the total number of bridges to be subject to SCMI in the 6 year period starting in April 2001 as reported in our 2002 audit. It has been assumed that the SCMI assessments will be split equally across the years. While this will not entirely reflect the assessment programme it provides a good indicator of progress to date
- 11.1.104 1,953 SCMI examinations were due in 2003/04. Of these only 975 were examined during the year. The 978 examinations not undertaken have not all been carried forward automatically into 2004-05 but are being risk assessed and allocated an examination date over the next 2 years. 211 examinations were reported in the Annual Return.
- 11.1.105 The significant shortfall was primarily a result of the late confirmation of the budget which was not sufficient for 1,953 examinations. The budget was confirmed eventually, but was approved too late to prevent the examinations contractor seconding personnel elsewhere.
- 11.1.106 Further, less significant, reasons for the shortfall of examinations were because possessions were not available for access, or the structure was a tenanted arch where access was not available.
- 11.1.107 A total of 2,758 SCMIs were in the database following an audit by the examinations contractor. When all of this year's audits are included this will rise to 2,859, however this is still 44% less than the number required to meet the 6 year examination target.
- 11.1.108 This shortfall includes 475 SCMI examinations that should have been carried out in 2001/02 and 2002/03. These were not programmed in 2003/04 and are in a Network Rail risk assessment process for carrying forward and allocating an examination date.

Data Management

- 11.1.109 The examinations contractor realised just prior to the audit that there was a significant amount of data missing from the database. We note that the database had previously been with Network Rail and the Contractor had been entering data into it over about 3 months.
- 11.1.110 We recommend that a detailed reconciliation of the database against the SCMI examinations is undertaken to ensure that it is robust.

Accuracy and Review

- 11.1.111 Network Rail's desk top audit of the SCMI examinations is limited to a check that the SCMI marking sheet and sketches are included in the report.
- 11.1.112 Early in the 2003-04 year audits were undertaken by Network Rail on site at around 10 bridges to check sketches and review scoring. The results were not run through the SCMI tool or followed up with the examinations contractor. Resourcing constraints were given as the reason that no further audits were carried out.
- 11.1.113 At the examinations contractor most examination reports containing SCMI are reviewed by the same person. During the review, sketching and labelling is checked using the photographs as a reference and the SCMI scoring is reviewed against the examination report text. The examinations contractor consider the check is worthwhile for labelling error identification and major defects not reported, but that is it not so effective at reviewing extent of defects or picking up defects missed entirely in the report.
- 11.1.114 In addition a general audits of 5% of examinations output are carried out by the Area Managers with check boxes for SCMI sketches and marking.
- 11.1.115 We recommend that both Network Rail and the examinations contractor should visit sites regularly to audit SCMI on structures, seeking to check sketches and all the marking and to feedback to the examiner, ideally with the examiner present. Our recommendation is based on such audits being the only real regular check on how well SCMI is being carried out.
- 11.1.116 Network Rail in Southern are not directly represented on the SCMI user group and felt isolated from it. Steps should be taken to copy all past and future correspondence about the user group to them and invite them to participate in meetings.

Resourcing

- 11.1.117 The Network Rail Structures Maintenance Team had vacancies during the reporting year. Two of the three Assistant Structures Maintenance Engineer posts, created at the April 2003 reorganisation, remained vacant throughout 2003-04. The new organisation from 24 May 2004 is of an appropriate size but currently has similar vacancies.
- 11.1.118 The examinations contractor noted that the examinations budget for 2003/04 was not confirmed early enough and they had to second some examiners to another organisation for some time to balance the available budget. The examinations contractor states that there were sufficient examiners in their team for the work throughout the year for the budget available at the time.
- 11.1.119 Late confirmation of the budget restricted resources and led to a shortfall in SCMI examinations. A shortage of Network Rail personnel appears to have restricted the scope of Network Rail audits during the year.

Procedures

- 11.1.120 Network Rail's procedures and guidance notes for the examination process and signing off were unchanged from last year. Network Rail intends to update these following the 24th May 2004 reorganisation and we recommend that this is done as soon as possible.
- 11.1.121 The examinations contractors' Project Plan was reviewed with the responsibility matrix of delegated responsibilities and the Project Process for Examinations dated June 2003. We found that these documents adequately described the examination process and responsibilities. A general update was required, in making specific reference to the ten year examination contract 2003-2013 on some documents and including recent changes such as the transfer of responsibility for the SCMI database to the examinations contractor.

Training Competence and Competence Management System

- 11.1.122 Appropriate competence (Unit 1 of RT/CE/S/047) and training was held by those in the Network Rail Structures Maintenance Team dealing with examinations and SCMI in 2003-04.

- 11.1.123 The Network Rail Competency File and Training Record System were reviewed. The auditor recommended that a list to identify names with responsibilities, and a method of tracking when a competency assessment expires should be added to it. The auditor also recommended that SCMI and other relevant training should be added to the competency system, so that particular training needs are visible and can be tracked. If these relatively minor changes are made then, in our opinion, the system will meet the requirements of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001, for a documented competency management system.
- 11.1.124 At the examinations contractor the team had the appropriate competency assessments and/or training. The competence process diagram and competence assessment spreadsheet provides the documented competency management system required by RT/CE/S/047. The auditor suggested a date of latest change is added to the spreadsheet to identify it with a point in time.

Overall

- 11.1.125 In Southern Region the examinations contractor continued their role from the 2001-03 contract into the ten year contract that started in April 2003. The Region did not have the significant start up issues experienced in East Anglia and LNE Regions.
- 11.1.126 Basic procedures and systems for the examination process were in place at both the examinations contractor and Network Rail, although at the latter some further work and updating were required.
- 11.1.127 Progress in SCMI as given in the Annual Return was poor but this was due to slow reporting of SCMI due to resource issues, particularly at Network Rail. At the time of the reconciliation following our audits, referred to above it had improved; 963 out of 975 SCMIs done in 2003-04 were in the database. This left a similar number, 978, that were not examined on site.
- 11.1.128 Late confirmation of budget from Network Rail had a significant influence in reducing what could otherwise have been achieved in Southern Region in SCMI in the year 2003-04. Non availability of possessions and being unable to access tenanted arches also contributed to the shortfall.
- 11.1.129 The examinations contractor has SCMI expertise in house. One of their Area Examining Managers comes from a background of developing SCMI and issues advice notes to examiners. Consideration should be given to making these available more widely to Network Rail Regions and other Examination Contractors.
- 11.1.130 There were vacancies within the Network Rail team throughout the year. The team had been unable to effectively undertake those measures that monitor how accurately SCMI is being undertaken and which, in our opinion will improve accuracy ie undertaking checks and audits on the work out on site. If the personnel complement had been complete then maybe these audits would be a regular feature.
- 11.1.131 The Examinations Contractor recognises that site audits to audit SCMI on structures, seeking to check sketches and all the marking is a next step but it is unlikely to happen in the near future. We think that it is essential in improving the accuracy achieved in SCMI that it does.
- 11.1.132 We recommend that both Network Rail and the examinations contractor should visit sites regularly to audit SCMI on structures, seeking to check sketches and all the marking and to feedback to the examiner, ideally with the examiner present. Our recommendation is based on such audits being the only real regular check on how well SCMI is being carried out.

Recommendations & observations

East Anglia Recommendations and Observations

- 11.1.133 The auditor recommended that Network Rail and the examinations contractor should carry out a thorough check of what entries should be in the database and ascertain that these entries and no others are present.

- 11.1.134 It is going to take to the end of the current year 2004-05 for the examinations contractor to get up to date on examinations and SCMI.
- 11.1.135 The auditor recommended that Network Rail should undertake routine visits to check sketches and rescore structures on site (using the examiners score sheet as a reference), as this is only check that Network Rail have on how well SCMI sketching and scoring is being undertaken by the examining team. These visits should preferably have the examiner present.
- 11.1.136 The auditor welcomed the checks recently introduced by the examinations contractor on checking SCMI by the Examining Engineer at the time of review of the examination report and the site audits that are just getting underway. The auditor recommends that a procedure for the latter should be prepared, updating the 1999 procedure seen at the audit to specifically include SCMI; checking of sketches and SCMI scoring on site using the examiners score sheet as a reference. These visits should have the examiner present.
- 11.1.137 The high level of personnel vacancies which existed at Network Rail throughout 2003-04 was and remains very unsatisfactory. We recommend urgent attention to it now that the territory reorganisation has taken place.
- 11.1.138 At the examinations contractor the team size was not large enough during 2003-04 and the current examiner team is being increased in size to meet the workload requirements and recover the present backlog by the end of 2004-05.
- 11.1.139 The auditor recommended that Network Rail should create procedures/processes that record all stages of the examination process in writing and who is responsible for each.
- 11.1.140 We recommend that the examinations contractor should bring their guidance notes and process map together, link them to the Network Rail ARM procedure and include who does what and where, as for example, some activities take place on site, some in Chelmsford and some in London. The aim is to document what is done and ensure that all stages are included. This would create an acceptable procedure for the examinations and SCMI process. The auditor suggested that this might be about 8 pages long plus one or two organograms. It was noted that the SCMI data input technicians, who manage the SCMI database, should be added to the organogram viewed.
- 11.1.141 A competence management system meeting the basic requirements of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001, should be created at Network Rail, to identify training and competence requirements and keep a record of what is held and when it expires, as has been recommended previously. Paragraph 5.1 of RT/CE/S/047 is the relevant reference. The auditor suggested the form that such a system might take.
- 11.1.142 Training for the RSE to Unit 1 of RT/CE/S/047 should be undertaken if he is to continue in this role. As previously identified, consideration should be given to providing an alternative competence unit that aligns with the ASME's responsibilities.
- 11.1.143 A competency management system should be established by the examinations contractor. The auditor recommended that it should include:
- (a) List of all personnel with job title and training that is considered appropriate;
 - (b) For each member of personnel a record of the training received and when it is due for renewal (if appropriate)
 - (c) List of all personnel with job title and competency that is considered appropriate. For each member of personnel a record of the competency held and when it is due for renewal (if appropriate). This can develop the sheets that already exist for the examiners but Examining Engineers, the underwater subcontractor and a general subcontractor must be added to it.
- 11.1.144 If these recommendations are implemented they would provide a competency management system to meet the basic requirements paragraph 5.1 of RT/CE/S/047 "Standards of Competence for Examination of Structures", Issue 2, February 2001.

- 11.1.145 The results of the Lloyds Register 2004 Audit for the Region should be analysed jointly by Network Rail and the Examinations Contractor. A plan should be put in place to action the measures necessary to educate the examination team to prevent a recurrence of the errors found.

London North Eastern Recommendations and Observations

- 11.1.146 Network Rail LNE should ensure that copies of the SCMI database are taken when data status is reported and at other significant points in data handling and reporting. These should include the items reported and not just the full database.
- 11.1.147 The examinations contractor should check that the single discrepancy found in the review of paper and electronic examination and SCMI records is only an isolated incident and is not a result of more widespread deviation from the process that should be followed.
- 11.1.148 The total of SCMI achieved to date is significantly below that which would have been anticipated had the programme continued to tackle all under and over bridges in six years. A decision has been made to match numbers of examinations to resources initially, and then reprogramme the remaining work. It will be thus after the end of 2006-07 before the first pass of SCMI in LNE is complete.
- 11.1.149 The auditor recommended that the examinations contractor should continue regularly with the recently introduced audits which include every examiner in each year. An emphasis should be placed on reviewing every line of the SCMI scoring sheet in the audit.
- 11.1.150 The auditor recommended that Network Rail should undertake routine visits to check sketches and rescore structures on site (using the examiner's score sheet as a reference), as this is the only check that Network Rail have on how well SCMI sketching and scoring is being undertaken by the examining team. These visits should preferably have the examiner present. These audits are in addition to the annual audit of the activities of the examinations contractor.
- 11.1.151 Network Rail LNE was short of personnel in the Structures Maintenance section in 2003-04 and remains so in 2004-05. This situation is undesirable and should be rectified.
- 11.1.152 The examinations contractor's team has grown over the year and it seems that there is now a plan of required resources in place, fully agreed with Network Rail, to tackle examinations over the next six years. At the audit we found that approval to recruit trainee examiners and a deputy Examining Engineer to increase the size of the team was awaiting authorisation from Network Rail. If the resources are agreed as necessary then we recommend that authorisation should not be withheld.
- 11.1.153 An updated version of the Network Rail LNE procedure, "Structures - Concept to Completion" dated November 2001 should be issued as soon as possible incorporating recommendations made previously. These were to include the file structure used in data handling of SCMI and the process of site rescorings by Network Rail.
- 11.1.154 We recommend that the examinations contractor produce a procedure/ guidance notes that covers the whole of their examination process from a work bank item to submitting the completed report to Network Rail. The process should be intended for copying to all of the examinations contractor's team.
- 11.1.155 During the audit we suggested using the form of a flow chart and notes showing all steps and who is responsible for each one. The flow chart already in place for the examiner's work could be used as a model. We also recommended that the job description sheets currently being drafted, and the notes from the October 2003 SEC Recommendations Workshop, should form an appendix to the procedure. The issue sheet recording issue of guidance notes to examiners should be brought up to date.
- 11.1.156 The SCMI Technician should be added to the summary of competencies required and record of competencies held in the examinations contractor's Competence Management System. The system should also have the appropriate training included for individuals, where they require training but not necessarily a formal competence assessment to RT/CE/S/047.

- 11.1.157 The examinations contractor should be provided with a copy of the SCMI tool to be able to run SCMI through as required. They should also be supplied with a copy of the developing SCMI database each period throughout the year, for reference as required.
- 11.1.158 Network Rail in LNE is not represented on the SCMI user group and should be involved. Steps should be taken to copy all past and future correspondence about the user group to them and invite them to participate in meetings.
- 11.1.159 The examinations contractor should be provided with a copy of the ARM procedures and definition for M8 Bridge Condition index, for information. They were not aware of its existence.
- 11.1.160 The results of the Lloyds Register 2004 Audit for the Region should be analysed jointly by Network Rail and the Examinations Contractor. A plan should be put in place to action the measures necessary to educate the examination team to prevent a recurrence of the errors found.

Scotland Recommendations and Observations

- 11.1.161 The auditor recommended that Network Rail should undertake routine visits to check sketches and rescore structures on site (using the examiner's score sheet as a reference), as this is only check that Network Rail have on how well SCMI sketching and scoring is being undertaken by the examining team. These visits should preferably have the examiner present.
- 11.1.162 The auditor also recommended that the examinations contractor should undertake similar routine visits to check sketches and rescore structures on site (using the examiners score sheet as a reference). This would inform the examinations contractor on how well SCMI sketching and scoring is being undertaken by the examiners.
- 11.1.163 The high level of personnel vacancies which existed at Network Rail throughout 2003-04 was very unsatisfactory. We note however that the new team that is in place from 24 May 2004 is of an appropriate size and requires only the Regional SME to be recruited to make up a full team. It was noted that this was expected within about 3 months.
- 11.1.164 The auditor recommended that Network Rail should create written procedures/processes as reference documents that record all stages of the examination process and who is responsible for each part. Recommendation of typical format and size were given at the audit.
- 11.1.165 The following modifications should be made to the examinations contractor's "Scottish Structures Examination Project: Project Specific Process", Issue 1 dated 10 March 2004, both as recommended last year:
- (a) The scope of the SCMI check in the office and its purpose should be added to the procedure;
 - (b) The process should be modified to include changes and corrections made to examination reports, so that they have an audit trail of the office change as the changes are made after the examiner has signed off the report and locked it. The procedure should be more readily available in the office, as during the audit there was some doubt as to exactly where it was stored.
- 11.1.166 Modifications made in the office to reports locked down by the examiner should be identifiable in the electronic audit trail.
- 11.1.167 The auditor recommended that an additional sheet or sheets should be added the Network Rail Competency Record to:
- (a) Describe briefly that the system is a competency management system to clause 5 of RT/CE/S/047;
 - (b) Describe what units of competence are applicable to appropriate team positions;
 - (c) Make clear who is responsible for maintaining the system.

The auditor also recommended that training records, where appropriate, should be kept in the same system in a similar format to the competency records.

- 11.1.168 For the examinations contractor's Competency System we recommended that:
- (a) The two sheets should be brought together into one spreadsheet for all of the examination contract personnel;
 - (b) The data should be brought up to date as there were some entries missing;
 - (c) A cover sheet should be added which states the examination contractor's policy of competency assessment, ie what competence is appropriate to any particular job;
- 11.1.169 We also recommended that training, and in particular SCMI training, where a competency assessment does not automatically follow for all personnel, should be recorded in a similar manner to competency records.
- 11.1.170 The examination contractor should be provided with a formal copy of the SCMI tool to be able to run SCMI through as required and should be supplied with a copy of the developing SCMI database each period throughout the year for reference as required.
- 11.1.171 The examinations contractor should be provided with a copy of the ARM procedures and definition for M8 Bridge Condition index, for information.
- 11.1.172 The results of the Lloyds Register 2004 Audit for the Region should be analysed jointly by Network Rail and the Examinations Contractor. A plan should be put in place to action the measures necessary to educate the examination team to prevent a recurrence of the errors found.

Southern Recommendations and Observations

- 11.1.173 We note that Southern Region was able to achieve only about half of the planned SCMI examinations because of the late confirmation of the examinations budget, requiring the contractor to reallocate resources elsewhere. We recommend that the budget is confirmed early enough in future to fund the resources for the work programme.
- 11.1.174 We note that non availability of possessions and non access to tenanted arches also had an effect.
- 11.1.175 Network Rail and the examinations contractor should ensure that the SCMI database is checked and reconciled against the data that should be in it to ensure that every entry that should be in it is present and no others are and that there are sufficient snapshots of the data to allow future backtracking if required.
- 11.1.176 The total of SCMI achieved to date is significantly below that which would have been anticipated had the programme continued to tackle all under and over bridges in six years. 978 SCMI examinations were not achieved this year and there are a further 475 examinations not carried out in the preceding two years. A decision has been made to risk assess all of these and allocate an examination in the next two years or so. Achievement of the first pass of SCMI in six years is dependent on examination resources to match future year's work load plus those carried over.
- 11.1.177 We recommended that both Network Rail and the examinations contractor should visit sites regularly to audit SCMI on structures, seeking to check sketches and all the marking and to feedback to the examiner, ideally with the examiner present. Our recommendation is based on such audits being the only real regular check on how well SCMI is being carried out.
- 11.1.178 The Network Rail Structures Maintenance Team was short handed during all of 2003-04. The vacant posts should be filled.
- 11.1.179 The Network Rail procedures and guidance notes for the examination process were not up to date or complete. The auditor recommended that Network Rail should update existing procedures and guidance notes and create new ones as required, to record all stages of the examination process in writing and who is responsible for each. We recommended that this was done as soon as possible.

- 11.1.180 The examinations contractor Project Plan and related documents should be updated to make specific reference to the ten year examination contract 2003-2013 where required and to include recent changes such as the transfer of responsibility for the SCMI database to the examinations contractor.
- 11.1.181 The auditor recommended that a list to identify names with responsibilities, a method of tracking when a competency assessment expires and SCMI and other relevant training should be added to the Network Rail Competency File and Training Record System.
- 11.1.182 The auditor suggested a date of latest change is added to the examinations contractor's Competence Assessment spreadsheet to identify it with a point in time.
- 11.1.183 Network Rail in Southern are not directly represented on the SCMI user group and felt isolated. They should be involved and should be invited to participate in meetings.
- 11.1.184 The examinations contractor should be provided with a copy of the ARM procedures and definition for M8 Bridge Condition index, for information.
- 11.1.185 The results of the Lloyds Register 2004 Audit for the Region should be analysed jointly by Network Rail and the Examinations Contractor. A plan should be put in place to action the measures necessary to educate the examination team to prevent a recurrence of the errors found.

12 Appendix E: Recommendations

Reference	Recommendation
4.2.3	We recommend that ORR and Network Rail agree target confidence grades for each measure for future Annual Returns and that Network Rail should develop an Action Plan for achieving these in each of the Regions.
5.1.50	We believe a target of B2 should be achievable for measure M1. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
5.1.51	We recommend Network Rail develop a robust standardised training programme for delay attribution, seeking to build on existing best practices in delay attribution and current training materials from headquarters and the Regions. All personnel undertaking attribution should be trained using this programme. This would much enhance reliability and accuracy of delay attribution.
5.1.52	We recommend Network Rail develop and document a single approach to the validation and audit of attribution. This would enhance the reliability and accuracy of delay attribution.
5.1.53	We recommend the results of Scotland Region's analysis of the Fife Circle WTT point-to-point timings and their implications for the present components of Rules of the Plan are reviewed. We believe that there will be transferable lesson from this work, particularly for the WTT planning process.
5.2.44	We believe a target of B2 should be achievable for measure M2. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
5.2.45	We recommend that Network Rail should issue a clear instruction to ensure RCF sites which have been re-railed should not be included in the continuous defect numbers if no cracking is present in the rails. This may require updates to Regional reporting databases but will provide a more accurate representation of the condition of the network.
5.2.46	We recommend the M2 measure is reviewed by Network Rail and ORR to investigate the usefulness of separately tracking 'sites with RCF' and the 'sites prone to RCF where no defects are currently present'.
5.2.47	Our auditors have been unable to establish robust audit trails for the M2 measure due to the extent of 'data refreshes'. We recommend that the procedure for the measure should require Network Rail reporting champions to provide a commentary explaining the reasons for these interventions, such that an audit trail is retained to support the reported data.
5.2.48	We remain concerned as to the extent of 'data refreshes' for the M2 measure. We recommend that Network Rail review the process of collecting and reporting the M2 measure to identify the causes of these interventions and take steps to eliminate these causes where practicable.
5.2.49	We recommend that the defect data in Raildata is subject to review and is refreshed as appropriate.
5.2.50	The Regions reported problems with 'false positives' using the UTU2 ultrasonic defect detection trains. The train-based system was reported to be identifying a significant number of defects which could not be validated using subsequent hand-held ultrasonic equipment. The situation requires investigation by Network Rail to ensure the outputs from these trains are reliable and can be efficiently validated fully using the inspection techniques available.
5.3.34	Validation of data remains a possible source of error for the track geometry measures. We recommend Network Rail reviews its method of validating data from the track recording trains before it is into its databases and makes changes as appropriate.
5.3.35	The annual track measurement plan was not met in 2003/04. We recommend that Network Rail should investigate the frequency and causation of missed data recording runs and make change to improve delivery as appropriate.
5.3.36	We believe that S&C has a disproportionate effect on overall track quality data. We recommend that the M3 measures for track geometry are reported separately for plain line and S&C to provide a more transparent assessment of network stewardship.
5.3.37	We recommend that poor track geometry (M3) and Level 2 exceedence (M5) measures are reported separately for plain line and S&C to facilitate analysis of the different maintenance and renewals activities on track quality for each track type. This would be of particular value for assessing the impact of the new S&C maintenance and renewals programme which is being implemented by Network Rail over the next five years.
5.3.38	We recommend that the linespeed bands in the track geometry and capability sections of the Annual Return should be consistent. If this is not possible, the variation in the data reported between the two measures should be explained within the commentary of the Annual Return.

Reference	Recommendation
5.4.43	Whilst the collection of the data within each Region and the calculation of the measure was found to be robust it is a time consuming process. In addition there are a variety of different methods used within the Regions to provide the data in a format consistent with the HQ reporting spreadsheet. We understand that Network Rail is considering collating the source data directly from the IIP database at HQ. We recommend that this change is undertaken, as it will be considerably more efficient and less to error.
5.5.65	We believe a target of B3 should be achievable for measure M8. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
5.5.66	Graphical representation of the SCMI results was included in the Annual Return for the first time. We recommend graphical representation by Region should also be included.
5.5.67	The data reported this year was a mixture of 2003/04 work banks and work done in previous years. We recommend the presentation of SCMI data in the Annual Return should include achievement against workload by year and cumulatively both to satisfy the ARM definition and measure progress.
5.5.68	We recommend the SCMI databases within the Regions should be subject to detailed audit to ensure that the errors noted in our report are not prevalent.
5.5.69	We recommend the SCMI database should be updated so that a clear audit trail of which SCMI examinations were reported to the ORR in which year is maintained. This was raised in last year's audit report.
5.5.70	Due to the timing of the Annual Return there was a significant discrepancy in some Regions between the SCMI data signed off by the Region and that contained in the Annual Return. We recommend that the Annual Return should reflect the data that is signed off by each Region and which the Region has compiled and "owns".
5.5.71	We recommend that regular site audits should be undertaken by both Network Rail and the examinations contractors. The audits should check the SCMI sketching and the marking of the structure using the examiner's original marking sheet as a reference and should cover all examiners during the year. This is to monitor the accuracy throughout the year in the Region and would replace Network Rail's reliance on the managing contractor's annual report.
5.5.72	Guidance notes on SCMI have been developed by one of the examination contractors. We recommend that these should be disseminated more widely.
5.5.73	The establishment of the SCMI user group since last year has provided a much needed source of technical guidance and established a forum for SCMI issues to be discussed and resolved. We recommend all Network Rail Regions should be represented on this body.
5.5.74	We recommend that the year of SCMI results reported should be 1st April to 31st March each year so that it aligns with the examinations year.
5.5.75	We consider that written procedures and a competency management system at Network Rail and the examinations contractors are necessary for SCMI. We recommend that these are established.
5.6.30	We believe a target of B3 should be achievable for measure M9. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
5.6.31	The audit of delay attribution processes undertaken in LNE Region revealed a 9% mis-attribution of delay for measure M9. We recommend that the guidelines developed in LNE should be assessed with a view to implementation across the network, to improve the consistency of signalling delay attribution.
5.6.32	There is a significant gap between the engineering view of signalling caused delays and those recorded in TRUST for measure M9. This could be partly addressed through a formal reconciliation with FRAME however changes would also be required to the Delay Attribution Guide so that the delay attribution process reflected the 'engineering view' on the root cause of delays.
5.6.33	We believe that there is significant benefit in undertaking a review of the Delay Attribution Guide for signalling failures measure M9, as this would provide a more accurate measure of the failure rates of signalling assets to the ORR and increase signalling engineers' 'buy-in' to measure M9.
5.6.34	We note that Network Rail is considering enhanced functionality and replacement systems for FRAME and TRUST. We believe delay and failure data should be held in such a way as to make their reconciliation easy; an accurate delay attribution process is necessary for customer-focussed asset management.
5.7.43(a)	The audit process defined in the procedure documentation RT/ARM/M9PR has not been implemented. It is critical that this is implemented for the forthcoming year in order to improve the consistency and reliability of assessments undertaken in the Regions.
5.7.43(b)	Questions within the SICA assessment which refer to more than one element should be split so that they refer to just one element. This will improve the consistency of assessments across the Regions.

Reference	Recommendation
5.7.43(c)	The SICA assessment should take into account any caveats or notes applied to the residual life generated. This is particularly important where the residual life stated is subject to life extension works.
5.7.43(d)	The results presented in the Annual Return reflect the average score from three different types of SICA assessment. These are not necessarily comparable and the results should be presented separately.
5.7.43(e)	Work should be been undertaken to establish whether it is possible to normalise the outputs from the difference SICA assessments to allow a more consistent set of condition assessments to be generated.
5.7.44(a)	We believe a target of B4 should be achievable for measure M10 in its current form. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
5.7.44(b)	The procedure and definition should be amended to formalise the current practice of applying adjustment factors to pSICA scores. The documentation for this measure is deficient until this recommendation is completed.
5.7.44(c)	The adjustment factor applied to pSICA residual lives should be reviewed in light of the last four years of condition assessments. This will improve accuracy for this measure.
5.7.44(d)	The definition of condition band 5 should be clarified and the scores for Sowdon Colliery and Betteshanger Colliery adjusted if appropriate.
5.7.44(e)	The historic data for this measure should be restated, reporting SICA 2B assessments for the year in which they were undertaken. The reported data will otherwise overstate the number of assessments undertaken in 2003/04.
5.7.44(f)	An interim regulatory target – or methodology for determining this target – should be developed as a large proportion of assets have now been assessed. This should take into account differences between the SICA methodologies used during the assessment programme.
5.7.44(g)	The data management process for this measure should be reviewed, particularly data manipulation and storage in the Headquarters reporting database. This should focus on reducing manual data processing, a data validation process to reduce errors, ensuring data integrity for assessments which are no longer included in the current average score (as the assets have been decommissioned or replaced). This will ensure a robust audit trail is retained for previous and future Annual Returns.
5.7.44(h)	Accountability and responsibility for future SICA assessments should be allocated to templated posts in the new organisation. We note, however, that it may be necessary to delegate these responsibilities to ensure the extensive knowledge base of existing SICA assessors is not lost from the process.
5.8.29	We recommend that the M11 and M12 procedures be changed so that TRUST is used as the single data source for determining whether an incident exceeds the delay threshold.
5.8.30	Generation of the reportable incident list by the HQ asset knowledge team appears to add little value to the M11 and M12 process, as this team does not have specialist electrification knowledge to identify root causation and the delay data used is not taken from the most accurate source. We recommend that the procedure be altered so that the data is generated Regionally from TRUST.
5.9.41	We note last year's recommendations for have not been implemented. We reiterate the key recommendations for M13 and M14 condition assessments below: <ul style="list-style-type: none"> (a) Investigation should take place into the inclusion of plant condition assessments within the Annual Return. (b) Assessments should be extended to include all of the asset, cables and switches. (c) Track paralleling huts should be included in the condition measure. (d) A separate measure should be introduced for high voltage cable systems. (e) The substation scoring system should be reviewed and simplified. (f) Assessments should take account of loading. (g) Greater use should be made of the results of condition monitoring tests and other information available in the Regions. (h) The condition of the building fabric should be subject to a separate measurement process so that equipment issues are not hidden.
5.9.42(a)	We recommend the programme of HQ audits should be extended to cover all Regions for both M13 and M14 measures.
5.9.42(b)	We recommend that the Regions should provide separate commentaries to HQ for M13 and M14, similar to other measures in the Asset Reporting Manual. We would expect the Annual Return to contain reference to specific areas of concern at a Regional level, which requires direct input from the Regional engineers responsible for the assets.
5.10.41	We believe a target of B3 should be achievable for measures M15 and M16. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.

Reference	Recommendation
5.10.42	Measure M15 requires a significant amount of resource to implement yet is of no practical benefit to Network Rail. This is of concern as a recurring issue raised in the audits was a shortage of electrification engineers leading to vacancies in the Regions. We recommend that Network Rail's current inspection processes should be compared with the regulatory inspection processes for M15, with a view to eliminating separate regulatory inspections and calculating the M15 measure from day-to-day inspections.
5.10.43	We fully support Southern Regions' proposal to undertake a one-off exercise to establish wear measurements for the majority of its third rail (M16), as this will bring significant benefits from better understanding the condition of its assets and improve the accuracy of the data reported for M16. We recommend that either (a) this proposal is implemented or (b) there is a significant increase in the size of the sample inspected each year.
5.11.28	The grading system for M17 should be revised so that it is linear, with each band representing a 20% decrease in residual life.
5.11.29	The current inspection methodology for M17 should be retained but revised weightings should be developed for each asset type. This would enable the historic inspection data to be restated using the new weightings, so maintaining comparability between previous years and control periods. The weightings should consider (1) Some assets are more important than others to customers (2) The condition of each particular asset type is also of differing importance to customers, and (3) The variation in levels of expenditure necessary to maintain or renew these assets.
5.11.30	The M17 measure baseline is the HAPM 'insured service life'; expected asset lives are about 5% greater. This will have the effect of understating the measure. We recommend the benchmark asset lives used for M17 should be reviewed.
5.12.26	The M18 measure currently focuses only on quantity. In addition to the recommendations for previous years' reports, we recommend that the measure should be reviewed to include weightings for other facets of facilities such as quality, functionality, effectiveness, customer benefits, condition, maintenance costs and renewal costs.
5.13.51	We believe a target of B2 should be achievable for measures M20-M29. We recommend Network Rail should develop an Action Plan for achieving this in each of the Regions.
5.13.52	In most cases, we were unable to consistently analyse each renewals workbank at the project level in a systematic manner, especially where projects were deferred or substituted for new previously un-budgeted projects. We would expect a single standardised workbank spreadsheet or other system to monitor forecast budgets in the Business Plan, year-start financial budgets, forecasts, actuals (ie inputs), project substitutions, project deferrals, outputs delivered and output targets at a project and workbank level. We recommended this is the minimum required, given the levels of expenditure involved and importance of the workbank in the renewals process. It would be invaluable to renewals engineers in their day-to-day monitoring of workbanks, investment panels in their authorisation of un-budgeted projects and would, of course, provide a suitable audit trail for the results reported in the Annual Return.
5.13.53	The inclusion of maintenance volumes in track renewals volumes was inconsistent between Regions. We recommend that a review of the process for reporting this information is undertaken and changes made to the ARM procedures as appropriate. We suggest that MIMS is the preferred source for this data.
5.13.54	With the exception of London North Eastern Region, little supporting data was received from the Regions detailing how SEUs were calculated and reported. We recommend that procedure for measure M24 should require the sign-off sheet shows each renewals project, the SEUs delivered, any weighting factors used in their calculation and a brief justification for the weighting factor used.
5.13.55	The definition of SEUs as outlined in the Asset Reporting Manual requires further clarification. We found under-reporting due to the imprecise definition for reporting of life extension works and minor renewals. We recommend that the procedure gives guidance on the reporting life extension works and minor renewals.
5.13.56	The structures renewals measures for culverts, earthworks and tunnels currently do not adequately represent the level of expenditure and activity undertaken by Network Rail. The measures for bridges and retaining walls report the number of jobs and the area in square metres affected to give a measure of size. We recommend that an indication of size is also required for the culverts, earthworks and tunnels measures. We suggest a linear metre might be an appropriate measure, though earthwork volumes, tunnel wall surface area and other alternatives should also be considered.
5.13.57	Analysis of Regional data shows Network Rail incurs significant spend on drainage works which are not reported in the Annual Return. We recommend that a measure of drainage renewal should be considered, such as drainage jobs greater than £50k and linear metres renewed.

Reference	Recommendation
5.13.58	The revisions made to the definition of S&C renewals, allowing for the inclusion of “partial” renewals, has had little effect on the reported figures with only 5 partial renewals being reported nationally in the Annual Return 2003/04. Network Rail acknowledges the difficulty it has had in defining S&C renewals to reflect the level activity undertaken on S&C units. We recommend that a review is undertaken to understand the issues in this area and changes made as appropriate.
5.13.59	We recommend the Annual Return renewals reporting process should be aligned with Network Rail’s internal business reporting processes which provide, on a monthly and a quarterly basis, detailed information on renewals activities based on unit costs, project progress and out-turn. This would create a more robust reporting process for the Annual Return data and reduce the work associated with two parallel reporting systems.
5.13.60	We recommend the cost distribution of renewed SEUs should be plotted as part of a review of using SEUs to measure renewals activity.
5.14.26	There has been a general increase in accuracy for the network capability measures in the Annual Return 2003/04. However, the process of reporting and validating network changes requires further consolidation to ensure Regions are consistent in their understanding and implementation of the reporting processes. We recommend further guidance, communications or training is required to further improve the accuracy of these measures.
5.14.27	We found evidence of delays in reporting of linespeed changes of up to six months, particularly where physical changes to the network result in a change to track formation. Although linespeed changes are reported immediately in the weekly operating notices, the process for updating GEOGIS is often slow. We recommend this process is reviewed and appropriate changes made as necessary.
5.14.28	We recommend that Network Rail adopt a consistent approach in the reporting of linespeed data (M3 speed band data and C1 linespeed capability); we suggest the track geometry bands should be used for both measures.
5.14.29	The network capability measures provide little indication of the true capability of the network. For example, the structures route availability figures do not include the maximum permissible speed at which vehicles may travel over structures with particular RA values, a highly important factor in understanding: <ul style="list-style-type: none"> (a) The operating characteristics of particular routes (b) Any improvements made to structures to allow the operation of rail services at higher speeds. We recommend that Network Rail, ORR and our auditors should discuss further measures that might better provide a measure of network capability.
5.14.30	We recommend that personnel attending audits for this measure in future years should have sufficient evidence and knowledge of an audit trail to support the figures presented in the Annual Return.
5.15.30	We recommend that personnel attending audits for the reconciliation against Business Plan in future years should have sufficient evidence and knowledge of an audit trail to support the figures presented in the Annual Return.
5.15.31	To support the reconciliation against Business Plan for regulatory reporting purposes, we recommend the proposed financial management tool IMS should – in addition to any other stakeholder or user requirements – have sufficient functionality to: (a) report data on a route-basis and (b) report variances between the published Business Plan, the year-start Budgets and year-end Actuals for routes and organisational units.
5.15.32	The supplementary business planning, budget management and reporting systems observed in the Regions has improved the day to day management of the renewals and investment portfolios, however these user-defined systems are not risk-free. We recommend Network Rail systematically check these supplementary systems.
5.16.24	We recommend CRRs in the HQ reporting database should be reviewed regularly rather than reviewed on an “ad hoc” basis to ensure the commentaries reflect current progress and improve the accuracy of the reporting process; a quarterly review should be adequate.
5.16.25	We recommend consideration should be given to expanding the CRR measure to incorporate other processes which demonstrate Network Rail’s responsiveness and achievements in delivering for its customers.
5.16.26	We recommend consideration is given to methods of incorporating Network Rail’s achievements from work associated with SRA approved or sponsored enhancements within the Annual Return.