FINAL REPORT

AN ASSESSMENT REVIEW OF TRANSCO'S MEASUREMENT SYSTEMS AND RIGs REPORTING

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Submitted by: **Wilcock Consultants**

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GLOSSARY

3P	Interruption caused by Third Party incident
Asset	Transco Asset – external mains and services including up to and including the Meter Control Valve
Asset ID	Unique reference identifying an individual asset
Call Centre	Transco Emergency Job Receive and Issue Centre
CI	Customer Interruption
CML	Customer Minutes Lost
CSEP	Connected System Exit Point – the connection point to a non Transco distribution Network
Data Warehouse	Core Transco database that holds all data
DI	Ductile iron gas pipe
Distribution Team	Transco Engineering Team working on mains and services
Downstream	Pipework and appliances after the ECV and not part of Transco's assets
ECV	Emergency Control Valve – valve to shut off gas in an emergency and usually found adjacent to the gas meter
EMW	Emergency and Meter Work system – used to control all emergency and meter work
ESE	Emergency Service Engineer – takes all first calls for emergency and meter work
FCO	First Call Operative – another name for Emergency Service Engineer
HSE	Health and Safety Executive
ID	Identity
IDV	STORMS Interactive Data Validation – error detection process for STORMS input
JIS	Job Issue System – issues work from EMW to ESE usually by data
LE	Interruption caused by Leakage
LTS	Local Transmission System – high pressure system controlled by the Networks for bulk supply of gas
MAPS	Online digital record system used in Transco Network offices

MF	Interruption caused by Mechanical Failure
MINE	Management Information iN Engineering – original engineering database
Network	Transco discrete geographical gas supply area
NM	Interruption caused by Non Mechanical Failure
NRSWA	New Roads and Street Works Act – controls how all utilities operate in the public highway
NTS	National Transmission System – high pressure system controlled nationally for bulk supply of gas
Ofgem	Office of Gas and Electricity Markets
OU	Operational Unit – local Transco base for operational staff
PE	Polyethylene gas pipe
PRE	Public Reported Escape – a gas escape outside the property
PUR	Purge and Relight – re-commissioning of the gas appliances after Transco work on the service
QB5	Project Quarter Back Phase 5 – latest phase of changes to operating procedures intended to reduce costs
REPEX	Replacement expenditure – budget for all activities involved with the replacement of gas mains and services
RIGs	Regulatory Instructions and Guidance
SA	Interruption caused by Service Alteration
SE	Service Engineer – see ESE
SI	Spun Iron Gas pipe
SR	Interruption caused by Service Relay
ST	Steel gas pipe
STORMS	Severn Trent Operational Resource Management System – work management system for work on mains and services
Supplier	Company licensed by Ofgem under the Gas Act 1986 to supply gas to domestic or non-domestic customers
TEAR	Transco Engineering Asset Repository – latest database for all Transco's <7bar Assets and associated equipment
Transco Centre	Transco head office

Upstream	Pipework and equipment prior to the ECV and part of Transco's assets and responsibility
WMS	Work Management System – interface between EMW and JIS
WR	STORMS Work Request – work document used for engineering work, usually system generated. Printed version of the WR, for completion by the distribution team leader is usually called a Job Card.

SUMMARY

1. This report is the result of an audit of Transco's compliance with the Regulatory Instructions and Guidance (RIGs) reporting requirements in respect of the number and duration of non-contractual customer interruptions (CIs). The audit was to assess also the potential accuracy of Transco's measurement systems and the programme of work Transco has introduced to improve data quality for CIs. The audit was conducted in April and May 2004 by the consultant, Wilcock Consulting, on behalf of Ofgem.

2. The audit also included a requirement for the consultant to develop a robust framework for undertaking formal audits in future years. Additionally, the accuracy of the reported data on Transco's mains and service replacement programme (REPEX) was audited.

3. The audit was carried out in two of the eight Transco Networks. The Networks chosen jointly by Ofgem and Transco were London and Scotland.

4. Transco has the necessary systems in place to record both customer interruption information and replacement data. However, the two main Transco computer systems used for CI information do not interact. Therefore, although the number of jobs requiring CIs is readily available, the reporting of customer minutes lost (CMLs) requires additional manual input. Errors and omissions with this input had lead to a high error rate in reporting details for the RIGs.

5. Forty two interruptions reported by Transco in the London Network and 68 in the Scotland Network were audited. Using the results across all interruption categories, data errors affecting accuracy of CMLs reported in the samples for both Networks were found to have reduced from Quarter 3 to Quarter 4 during the year April 2003 to March 2004. Overall in London, these CML errors reduced from 42.9% to 28.6% and in Scotland from 36.7% to 28.9%. The error types found were as already identified and described by Transco at preliminary meetings with the audit team.

6. Following process changes implemented recently in both Networks to address reasons for inaccuracies, further improvement in data quality should be expected for future reporting periods. These changes include matching up of Severn Trent Operational Resources Management System (STORMS) and Emergency and Meter Work System (EMW) documentation before data entry and decentralising ownership of error corrections within the Network.

7. Investigation of 12 replacement projects in the London Network and 18 in the Scotland Network showed that there was a high level of accuracy in reporting, with the length of main decommissioned under reported by 0.32%. This seems to have been caused by discrepancies in the Transco Engineering Asset Repository (TEAR) records resulting from the original digitisation of the mains records.

8. The audits highlighted a number of improvements that could be made by Transco to improve the accuracy of the information reported to Ofgem. Some recommendations on the revision of RIGs are made to Ofgem.

9. A future audit framework is proposed, but the final structure of this audit framework is contingent on the outcome of a further review by Ofgem and Transco of the job parameters to be considered by the audit in order to make meaningful assessments of CMLs and cross Network comparisons. For example further

disaggregation of job types to give greater relevance to customer interruption times may be considered.

1. INTRODUCTION

1. This Section outlines the requirements of and the background to the project undertaken during April, May and June 2004 by Wilcock Consultants on behalf of Ofgem.

2. Ofgem issued an invitation to tender under the terms of an established framework agreement on the 1st of March 2004 and a tender was submitted on the 22nd March 2004. Following the tender meeting the contract was awarded and started with a project initiation meeting on the 7th of April.

3. The project was undertaken by the following personnel:

David Haddock	Project Manager
Kieran Jones	Systems Engineer
Mike Chilton	Project Engineer
Peter Grimley	Senior Engineer

4. A full copy of the Ofgem original terms of reference for the project is included in Appendix E.

1.1 BACKGROUND

1. Ofgem is the regulator for the gas and electricity industries in England, Scotland and Wales. Its principal objective is to protect the interests of gas and electricity consumers, both present and future, by promoting effective competition where possible

2. As part of the last Transco price control review, which came into effect in April 2002, it was recognised that further work needed to be carried out to address some of the weaknesses which had been associated with the existing framework of price regulation. This included a commitment to developing an incentive scheme linking certain output measures to financial incentives under the price control mechanism – covering the number and duration of non-contractual supply interruptions. At the time of the project it was intended to introduce this incentive scheme on 1 April 2005.

3. The robustness of a quality of service incentive scheme on Transco depends on the consistency and accuracy of the information it is reporting. As such, and in parallel with the development of the price control framework, Ofgem developed detailed definitions and related instructions and guidance for the measurement of the number and duration of interruptions and other output measures. These were published in the Regulatory Instructions and Guidance (RIGs) in February 2002 with a revised version published in February 2004.

4. The scope of the information that Transco is required to provide under the RIGs outputs reporting framework includes the following:

- The number and duration of Network non-contractual supply interruptions
- Percentage of shipper queries resolved within 4, 10 & 20 Transco days and the mean time to resolve outstanding queries
- The reliability of the M number CD Rom service
- The kilometres of main decommissioned and replacement mains installed per year

- The number of services decommissioned and transferred and replacement services installed per year
- Network peak demand
- Data on the environmental performance of Transco's National Transmission (NTS) and Distribution Networks and accompanying narrative
- Supporting information for Transco's NTS and Distribution Networks

5. Transco was required to report performance in accordance with the RIGs from 1 April 2002. Due to difficulties regarding measurement systems, Transco was allowed to delay reporting of the interruptions outputs until April 2003

6. As part of the price control agreement, Ofgem indicated that an audit would take place in order to:

- Assess and review Transco's measurement systems for reporting the number and duration of interruptions
- Assess the potential accuracy of Transco's interruptions' measurement systems
- Assess Transco's compliance with the RIGs reporting requirements in respect of interruptions
- Develop an audit framework for assessing the accuracy of reported interruption data in future years

7. Ofgem intends to use the results of the audit to further inform its thinking on the appropriateness for introducing quality of service incentives for Transco's Networks. Ofgem needed to gain a thorough understanding of how Transco reports interruptions, from the interruption start through to a customers supplies being restored. In addition an understanding of current and achievable levels of accuracy of measurements systems used to report numbers and durations of interruptions was required.

8. This project is the initial audit of measurements systems and interruptions and REPEX data and the results and outputs from the project are intended to identify strengths and weaknesses along with potential sources of inaccuracy in reporting and systems. As part of the project it was intended that, where appropriate, recommendations would be provided to Transco.

9. From the outset of the project a collaborative approach was taken with all three parties involved working closely together to openly share knowledge and information.

10. At the time of the project Transco had already provided Ofgem with three quarters of interruptions data (i.e. in respect of the number and duration of interruptions) for 2003/04. Information on the final quarter of 2003/04 was provided at the end of April

1.2 AIMS OF THE REVIEW

1. In brief the aims of the review were to help Ofgem to understand the systems used by Transco for the reporting of interruptions and the accuracy of data provided on a quarterly basis to comply with RIGs requirements.

2. In addition, it was intended to assist the development of Ofgem's thoughts on the use of interruptions data as part of a wider quality of service framework.

3. A review was required to assess Transco's compliance with RIGs reporting requirements in two specific areas:

- Non-Contractual Customer Interruptions
- REPEX Data relating to mains and service renewals to comply with the Health and Safety Executive (HSE) programme requirements

4. It was also intended that this project should provide the framework for future audits to be completed to assess ongoing compliance with RIGs requirements.

5. The six main areas of activity and deliverables for the project are summarised in the Scope of Work below.

1.3 SCOPE OF WORK

The following details the scope of work for the project. This was instigated at the time of the invitation to tender and further developed during the early stages of activities

1.3.1 Customer Interruptions Reporting Process

1. Transco currently reports interruptions information in standard MS Excel spreadsheets. As part of the project an assessment of the sufficiency of this method was required, in addition the consultant was required to provide any recommendations for future changes. Data for submission in the spreadsheets is extracted from main Transco computer systems for work and asset management.

2. In order to generate data for the reporting of interruptions Transco had introduced new work practices and system changes. The project aimed to review these and to make suggestions for changes to these processes or recommendations on alternatives.

1.3.2 Accuracy of Customer Interruptions Reporting

1. After a full year of reporting under the RIGs Ofgem required a technical consultant to review Transco's measurement systems for reporting the number and duration of interruptions, assess the potential accuracy of Transco's interruptions measurement systems and assess Transco's compliance with the RIGs reporting requirements in respect of interruptions.

2. As part of the work on assessing the potential accuracy of measurement systems, the consultant was required to make recommendations to Transco on how to improve the robustness of their systems, taking into account the costs and benefits of these recommendations and any information provided by Transco on the potential impacts they might have on safety

3. The assessment of accuracy focussed on a number of areas:

- Accuracy relating to the numbers of interruptions reported
- Accuracy relating to the definitions of interruptions as defined in the RIGs procedures

- Accuracy relating to the of duration of interruption

4. Before the start of the project it was known that there were large levels of error in data relating to the number and duration of interruptions being reported and that there were wide variations in errors between individual networks. For the nine months of data reported at the start of the project Transco estimated that the level of error was approximately 50% overall.

5. The analysis required was both qualitative and quantitative.

1.3.3 REPEX Reporting Process

1. Replacement expenditure during the current price control period is projected to increase significantly compared to previous years. This is a result of a decision by the HSE to require Transco to replace all cast and ductile iron gas mains within 30 metres of all premises over a 30-year period.

2. Under Section 5 of the RIGs Transco is required to report performance against the HSE mains replacement programme. REPEX data is reported to Ofgem on an annual basis using a standard Excel spreadsheet format with source data being extracted from Transco's work and asset management systems.

1.3.4 Accuracy of REPEX Reporting

Under the RIGs, Transco is required to report its progress against the mains replacement programme. The project involved an audit of reported performance against Transco's field records with regards to the accuracy of lengths reported and also the compliance with RIGs in relation to diameters and material types.

1.3.5 Future Audit Framework

1. Ofgem intends to carry out formal annual audits of Transco's measurement systems and reported data for the number and duration of interruptions from 2005/06 until the end of the current price control period. As such, a key objective for this project was the development of a robust audit framework for use in future years. This audit framework was to include a method for assessing the accuracy of measurement systems and calculating the accuracy of reported numbers on a statistical basis.

2. At the time of the project it was recognised that the structure of Transco and the potential ownership of a number of individual Networks was going through a process of potential change. Although the requirement for the reporting of the RIGs data will still be applicable in any new structures it was recognised that this needed to be taken into account in recommending a future audit framework.

1.3.6 Assessment of Training and Action Plans

1. Prior to the introduction of the RIGs requirements Transco instigated a programme of training in order to ensure that all appropriate personnel were aware of the requirements and the implications of the RIGs.

2. In an attempt to reduce the numbers of errors in the reporting process action plans were put in place at Transco Centre and within each of the Networks to ensure that the RIGs requirements for customer interruptions and replacement were being complied with and in order to monitor and improve performance and compliance.

3. As part of the project an assessment of the training processes was required in order to comment on the successfulness and appropriateness of the training. A review of the success and ongoing implementation of the action plans was also required.

1.4 REPORT STRUCTURE

1. This report on the 2003/2004 audit on Transco's RIGs reporting of customer Interruptions and REPEX work is structured as follows:

- Section 2 explains the methodology applied to each Section of the audit, providing details of the procedures, forms and questionnaires that were used to provide consistency between the Network visits

- Section 3 contains the key findings from the audit visits including analysis of the results

- Section 4 contains a summary of the main recommendations that followed the completion of the audit

- Section 5 contains lessons learned from the audit and proposed modifications to the audit framework to be used in future years

- Section 6 contains a brief conclusion

2. A number of Appendices have been included for the inclusion of associated documentation, data and tables generated during the life of the project.

2. METHODOLOGY

2.1 OVERVIEW

This Section provides details of each stage of the audit framework. It also gives details of internal processes/procedures that were in place to ensure that consistent audits took place in each Network.

2.2 REVIEW PREPARATION

2.2.1 Pre-visit Discussions

1. Prior to the visits to Transco offices in Solihull, Slough and Glasgow a meeting was held at Ofgem's Millbank offices on 7 April 2004. Present at the meeting were the Wilcock Consultants' audit team, members of the Ofgem Quality of Supply team and representatives from the Transco Centre team.

2. The purpose of the meeting was to introduce the audit team, confirm the collaborative approach to the audit, confirm the aims of the audit and agree the visit timetable and working arrangements. During the meeting the Transco team gave a presentation entitled 'How and Why Gas Supplies are Interrupted and Restored'.

2.2.2 Pre-visit Activities

1. Following the award of the audit contract, Ofgem supplied details of customer interruptions for the first three quarters of the 2003/2004 reporting year (April 2003 to March 2004), together with the REPEX results for the year 2002/2003. This gave the audit team a chance to analyse the data before the Transco visits and formulate the guidance notes to be issued before the visits to Transco sites.

2. In addition a thorough review of the RIGs requirements and all associated documentation that had been made available was undertaken by the audit team.

2.2.3 Guidance Notes and Specification of Requirements

1. Before the visit to Transco's Solihull office the audit team issued a guidance document giving details of the computer systems, procedures, training packages and reporting systems that the Transco Centre team should be prepared to brief. These included:

- EMW
- STORMS
- Project Quarterback Phase 5 (QB5)
- Training packages
- Action plans
- TEAR

2. Following input from the Transco Centre team during the Solihull visit, an amended guidance note was issued to the two Networks to be visited. This included a proposed timetable for the visit and a suggested list of local topics that the Network should be prepared to discuss including:

- Unique Network issues
- Network understanding of the RIGs requirements
- Network RIGs instructions
- Data issues
- Office procedures
- Administrative issues

3. Copies of the guidance notes issued are included in Appendix F.

4. In addition to the guidance notes, standard documents were developed to gather data with regards to Interruptions and REPEX. Copies of these are included in Appendix H. Also a standard question framework was developed and jointly agreed with Ofgem to ensure that all areas within the scope of work were adequately covered during the visits. A copy of this is included in Appendix G. The question framework was not intended as an individual questionnaire but more as a checklist for the audit team to ensure that all areas of the audit were covered.

5. The use of the guidance notes, data collection documents and question framework ensured that a consistent and thorough approach was taken during the visits.

2.3 METHODOLOGY

1. A proposed method of approach was provided at the time of tender for the project. This was adapted during pre-contract award stages and the initial stages of the project. The overall method of approach was intended to be flexible to allow for any required changes during the life of the project.

2. One of the key issues in the completion of the project was a collaborative and close working relationship with Transco and Ofgem to ensure that the project bought benefits to both parties wherever possible.

2.3.1 Selection of Audit Samples

2.3.1.1 Customer Interruptions Samples

1. Transco provided the audit team with an Excel spreadsheet listing the following data on jobs for which CIs had been collected in Transco's Data Warehouse for both Networks to be visited:

- Period (i.e. reporting period)
- Interruption category (in accordance with the RIGs definitions)
- Duration (length of interruption)
- Job type (as used in STORMS)
- Consumer type (domestic, commercial or industrial)
- Priority (as defined by the suppliers)
- Originating EMW reference
- STORMS reference
- Purge & relight reference from EMW

2. This data had been used to compile the number and duration of customer interruptions required under the RIGs for the quarterly reporting periods during the year April 2003 to March 2004.

3. From inspection of the spreadsheet provided by Transco, the following observations were made by the audit team:

- It seemed that limited sense checking of interruption data may have been applied, particularly because of the incidence of very long and very short durations reported.
- There appeared to be a high frequency of rounding of CMLs.
- Many CMLs appeared to be approximations for their particular job type.

4. A selection of jobs for each sample was made to give a spread of CI durations for planned and unplanned activities for each interruption category reported, taking into account customer type and priority, and job type. Not all interruption categories were reported into the Data Warehouse from the two Networks during the periods chosen. Sample sizes were chosen to reflect audit resources and time allocated for each Network visit.

5. The first sample of jobs in the London Network was selected prior to the review carried out in Slough. Subsequently, a sample of jobs in Scotland Network was selected prior to the review carried out in Glasgow. Each review sample, containing the original job details extracted from Transco's spreadsheet, was supplied on Excel spreadsheets to the Networks prior to the review visit.

2.3.1.2 REPEX Samples

1. Transco provided the audit team with an Excel spreadsheet that contained details of all the mains units decommissioned in the 2003/2004 financial year for the two Networks to be visited. These details included the mains unit ID reference, length, size and material. Each Network had over 3000 decommissioned mains units that added up to over 200 km of main abandoned during the year.

2. The records were then sorted by length, so that longer lengths of decommissioned mains could be audited. It was anticipated that this approach would identify mainlaying projects with a mix of mains ID lengths, including shorter lengths associated with road crossings and connections. A random sample of 20 mains units was chosen for each Network (see Appendices B and D). Details of these mains unit asset IDs were passed to the Networks in advance, so that the relevant project files could be prepared ready for the Network visits. The Networks were asked to include in the project files as a minimum:-

- The work requests for all the mainlaying within the project
- Proposal drawings
- As laid drawings if available
- System generated lists of the associated servicelaying work

3. A checklist (see Appendix H) was produced in order to record the selected mains unit details, associated decommissioned and relaid mains and servicelaying work within the project in a consistent format.

4. As part of the visits 12 project files in London Network and 18 project files in Scotland Network were audited. Checks included:

- Comparison of lengths, both decommissioned and relaid, claimed on the mainlaying work requests against the system records.

- Comparison of proposal and as laid drawings to confirm that the work requests covered the full extent of the project, and the lengths claimed were consistent. The use of copy drawings meant that these were not always to scale, but at least allowed a check that length recorded was reasonable.

- Comparison of the servicelaying lists with the proposal drawings to highlight any obvious anomalies in the records. However as not every property has a gas supply, this was not a foolproof check. It was not possible to identify non-domestic properties from the drawings, so the split between domestic and non-domestic properties could not be verified.

2.3.2 Accuracy of Measurement Systems

As all work carried out is recorded on either EMW or STORMS, the information held on these systems for both customer interruptions and replacement work was compared with the information recorded on paper documentation (if appropriate). Additionally, for mains replacement work, access was made to TEAR in order to assess the accuracy of data recorded.

2.3.2.1 Customer Interruptions Data

1. Accuracy of the number and duration of customer interruptions reported to Ofgem depends on the correct recording of the start and end times of the customer interruption. These times are defined in the RIGs as follows:

2. The start of an interruption is the earlier of:

- The date and time of closure of the meter valve by Transco personnel (or in some emergency situations the consumer)
- The date and time of plant isolation by Transco personnel and
- The date and time logged by call centres for multiple losses of supply from a single cause.

and

The end of the interruption is the earlier date and time of:

- Re-commissioning of consumer appliances (where it is safe to do so)
- Notification to the consumer's address that gas can be restored to the premises when access can be arranged
- Notification to the consumer, or to the consumer's address, that there are considerations outside Transco's control (in the absence of which the gas supply could be restored to the premises) which prevent restoration of supply, following notification from Transco that the gas

supply could be restored the consumer requests that restoration is delayed or reconnection is subject to the resolution of a dispute

3. The validity and accuracy of start and end times were assessed using information available in STORMS and EMW.

4. For jobs where it was appropriate to take the interruption start and end times recorded by the distribution team, access to STORMS CI information was sufficient to check that the times were consistent with other information available for that job. For example, using job start and end times, job type and work method, the audit team, with the help of Transco as required, were able to make an assessment regarding the length of interruption time reported.

5. Where considered relevant as part of the interpretation, access was also made to EMW to check purge and relight records for the job address at or about the time of the work recorded in STORMS.

6. Jobs with an end time in EMW require a STORMS reference to be recorded in EMW, whereas jobs with a start time in EMW require an EMW reference to be recorded in STORMS in order to connect those times for reporting of the CML from the Data Warehouse. In these cases, the validity of the STORMS references was assessed.

7. Relevant CI details collected in STORMS and EMW are extracted from the Data Warehouse in order to produce the CI data provided to Ofgem. Consequently, assessment of the accuracy of data transfer between systems was also required i.e. a comparison of the output of CMLs from the Data Warehouse with the interruption details held in STORMS and EMW.

2.3.2.2 REPEX Data

1. In order to assess the accuracy of REPEX data, full details from the original project files generated in the Networks were required along with copies of the asset records currently held on TEAR. Where possible, the actual work records including both manual records and STORMS records for completed work were examined.

2. The following specific information with regards to each project file was requested:

- WRs (including paper job cards, as appropriate) for the abandoned mains including lengths of the abandoned spans
- WRs (including paper job cards, as appropriate) for the relaid mains
- Proposal drawings
- As laid drawings
- System generated lists of WRs raised for relay and transfer services

3. From the project files, data was gathered onto the data collection forms as detailed in Appendix H and this data was then entered into Excel

spreadsheets and assessed for accuracy. The results are detailed in Appendices B and D.

2.3.3 Review of Customer Interruption Reports

1. In order to complete the review of Transco's compliance with the requirements for reporting customer interruptions, it was necessary to be able to answer a number of questions:

- Does Transco understand the RIGs definitions as stated?
- Has Transco established and categorised correctly all those job types that fall within the reporting requirements?
- Has Transco provided reports when required?
- Do the report formats comply with RIGs requirements?
- Are the calculations used within the reports accurate?

2. The above questions do not address issues relating to the accuracy of the information provided in relation to numbers and CMLs.

3. In order to assess the reports provided, data and information requirements were set out in advance of visits to both Transco Centre and the Networks.

4. The RIGs reports for the first three reporting quarters of 2003/2004 were made available in advance for review. Section 3.3.2 highlights the results of the review in this area and provides further details on the classifications of interruptions, Transco job types generating interruptions and the format of the reports provided to Ofgem.

5. During the process of the review, the following areas were assessed in order to evaluate understanding and compliance with the RIGs requirements at all levels.

- Evaluation of the content of Training materials
- Discussions with individuals both at Transco Centre and in the Networks
- Assessment of Transco job codes relevant to RIGs job types
- Assessment of data used for the extraction and reporting of RIGs information
- Assessment of RIGs reports provided to Ofgem by Transco on a quarterly basis
- Random checking of data presented in the reports to check arithmetical accuracy

2.3.4 Review of REPEX Reports

Copies of the REPEX reports, submitted by Transco to date, were used by the audit team to assess the structure and content, to ensure that these met Ofgem's reporting requirements.

3. SUMMARY OF REVIEW RESULTS

3.1 OVERVIEW

This Section provides the results of the review into the accuracy of the measurement systems, Transco's interpretation of the RIGs definitions, Transco's reporting into the agreed template and the accuracy of the data reported to Ofgem.

3.2 GENERAL FINDINGS

1. Prior to the review of data, views expressed by Transco managers, centrally and in the Networks, regarding implementation of the requirements to collect CI information for the RIGs and the progress to date of initiatives to improve data quality were candid. When the STORMS and EMW systems were built there had not been a requirement to capture and report CI data. However Transco was given an allowance under the current price formula for the cost of implementing the RIGs reporting requirements. Transco managers have recognised the difficulties of collecting that data via these two systems that operate independently from of each other and which were designed primarily for work management purposes of two different work forces with different skill sets.

2. Mistaken practices when recording start and end times, such as use of 'gas at exit point' for end time, or omission of the necessary reference numbers were raised as reasons for inaccurate CMLs and failure to collect a CI, respectively.

3. It was also clear from Transco that the improvement actions likely to be most effective in the two Networks had been implemented for only a few months and would have had little impact on the quality of data reported to Ofgem and assessed as part of the review. These actions are mentioned elsewhere in the report.

4. Consequently, there was an expectation on the part of the audit team that errors would be found as indicated by Transco, examples of which are mentioned in Section 3.3.1.

5. In preparation for implementation, responsibilities for RIGs matters were allocated to Transco managers both at Transco Centre and in the Networks. Initial training materials on the reporting of the number and duration of interruptions information in line with the RIGs were produced centrally in Transco and supplied to the Networks and Call Centres. Lead Network trainers were trained to train Network personnel, some of who in their turn carried out training of other staff and contractors' managers. Contractors' managers trained their own personnel. Other lead trainers were used to take the training into the Call Centres.

6. Discussions with Transco and Contractors' managers indicated that for both Transco staff and contractors there was limited evaluation of the success of the training. No structured follow-up was carried out, soon after implementation, to confirm the understanding of the reporting requirements and the application of that understanding.

7. It is the view of the audit team that a structured follow-up would have reinforced the efforts of the implementation programme at an early stage by improving the understanding of staff and contractors regarding their part in the process of collecting data on the number and duration of interruptions. This action would have anticipated the need for some of the recent support required in order to reduce errors in the number of CIs reported and to improve the accuracy of CMLs.

8. With failure to successfully report high percentages of CIs from STORMS and EMW into the Data Warehouse, Transco identified reasons for failure, such as the omission of cross referencing of EMW to STORMS, and took action to improve the success rate. This included further briefing sessions to Transco staff and contractors regarding, for example, proper completion of the section of the STORMS job card for start and end times and end reason.

9. Continuing high failure rates contributed to a rising priority to address the situation more effectively by further training and support within the Networks and Call Centres. A centrally monitored Improvement Team, including representatives from all Networks, the Call Centres and Transco Centre, co-ordinates this activity and, normally, this national team meets monthly at an Improvement Workshop.

10. The Improvement Workshop serves as a forum to consider issues and solutions and to share best practice. Transco Centre indicated that attendance at these Workshops had been good with almost all Networks attending almost every Workshop. Networks had been free to assess their own priorities regarding attendance. Notes from the workshops were circulated to all Networks to ensure that they were kept informed of current RIGs issues and practices across Transco.

11. Ownership of the relevant improvement actions rests with the management of the units concerned i.e. Networks, Call Centres or Transco Centre. Sharing of best practice for the improvement of data quality is an important objective, recognised by Transco's monthly interruptions workshops.

12. For example, a major reason for interruptions not being collected is error or omission of the STORMS reference number in EMW when it is required to link STORMS and EMW jobs in the Data Warehouse. As an additional process step, suitably trained staff are used to check consistency of STORMS and EMW documents before the data is entered into the systems, in both Networks visited.

13. Normally, EMW data not collected via the field data system is entered from paper records by the Call Centres, located at sites remote from the Network offices.

14. The implementation of RIGs has necessitated system and process changes referred to in this report, and more resources from both Transco and its contractors to collect additional data in order to produce reports on CIs.

15. In London Network, approximately seven staff are involved in error correction or additional process steps to improve data quality. This involves the interrogation of both STORMS and EMW in order to find the missing reference numbers and times. Managers at various levels are also involved in co-ordinating and directly supporting collection of CI information and improvement of data quality. Two additional contract staff also cross check the contractor's paperwork before input to EMW.

16. In Scotland Network, approximately three Transco staff and two contractor's staff are involved in this work. Again, managers at various levels are also involved in co-ordinating and directly supporting collection of CI information and improvements to data quality.

17. There are variations between Networks reflecting both the demographic and geographic differences.

18. In London Network, Transco has indicated that, customers' long absences from home due to commuting and a high proportion of second homes, the high churn rate amongst tenants, and street congestion are major problems. Additionally, there are many multi-occupancy dwellings with gas supplies and difficulties in co-ordinating with customers and others having responsibilities for the buildings. Consequently, co-ordination of works tends to be more difficult and execution of jobs more protracted. In these cases, the availability of customers to give access for re-commissioning their appliances at the earliest availability of restored supply tends to be less. As access to all properties in the building is required before the gas supply can be restored, this can potentially extend the recorded CMLs.

19. In Scotland Network, working customers tend to spend less time commuting, absences from home are less problematic, there is a lower churn rate amongst tenants and street congestion is a lesser problem away from the main centres. There are also fewer CML difficulties associated with multi-occupancy dwellings. Relative to London Network, these tendencies potentially reduce the recorded CMLs.

20. For planned work (mostly replacement projects), domestic customers are notified at least 10 days in advance that replacement work affecting their supply will take place. It is a minimum requirement that at least 5 days notice is given. Non-domestic customers are notified in accordance with the Network Code. Customer priorities are assessed during advance surveys and during the course of works in order to ensure that the needs of the elderly or infirm, for example, are recognised and supply interruption times minimised.

21. Transco indicated that their standard advance notification letter gives customers a contact telephone number for the project. This allows the customer to arrange a convenient time for the purge and relight if access is not made available when the gas supply is restored. Alternatively, a service engineer working with a replacement project will respond, as far as possible, to timings requested by the customer for the purge and relight, often during the course of the works.

22. The above practices tend to lengthen the apparent CMLs compared to those that Transco could report if cards were left at customers' premises upon completion of the works advising the customer to make contact with a general number when they return home. Further, taking the purge and relight request outside the project by leaving a card, as described increases costs as the purge and relight would then be carried out by a Transco First Call Operative (FCO) out of hours rather than the contractor's service engineer, whose costs are already included in the contractor's unit rates for service replacement under the period contract with Transco.

23. The view of the Networks audited is that the management of purge and relights as far as possible within a project is generally perceived as a customer friendly practice. It is also the Networks' view that this meets the customers' aspirations and it is part of the rapport developed with them during the survey and preparatory stages of a project and the subsequent work on site.

3.3 CUSTOMER INTERRUPTIONS

3.3.1 Accuracy of Customer Interruptions Systems and Data

3.3.1.1 Data Systems

1. There are two separate primary work management systems – EMW and STORMS/QB5.

2. Emergency and Meter Work (EMW) is used for:

- Scheduling and issue to Emergency Service Engineers of electronic job instructions for attendance to Public Reported Escapes (PREs)
- Capture of actions required to ‘make safe’ and subsequent follow-up work
- Additional management of Meter Work (installation, maintenance, removal)
- Recording from paperwork job cards of actions by Service Engineers supporting planned work

3. The Severn Trent Operational Resource Management System (STORMS)/Quarterback 5 (QB5) is used for:

- Scheduling and issue to Distribution Teams of job instructions for work on mains and service assets
- Capture of changes to asset details (mains and services) for update to TEAR
- Capture of actions to ‘make safe’ and subsequent follow-up work
- Additional Management of the New Roads and Street Works Act (NRSWA) obligations
- Jobs raised in STORMS; completed through the QB5 field terminal; automatically closed in STORMS

Data Item	Potential Source
Interruption Start Date/Time	• EMW – Call Centre or ESE • STORMS(QB5) – Engineering Team or Contractor
Interruption Category	• STORMS(QB5) – Engineering Team
Interruption End Date/Time	• EMW – ESE or SE for Purge and Relight on planned interruptions • STORMS(QB5) – Engineering Team or Contractor

Table 1 - Key Data Sources

4. A guide to the total number of interruptions can be obtained from the number of completed STORMS jobs of the job types listed.

5. For CMLs, interruption details must clear validation in STORMS/QB5 and/or EMW before passing to the Data Warehouse from where they can be reported.

6. Reporting levels for the quarter to the end of March 2004 (Quarter 4) are:

Completed Jobs in STORMS on Jobs attracting CIs	112760
RIGs Reportable Interruptions in Data Warehouse	69736
Errors generated	151548
Errors Cleared	78005
RIGs Reportable Interruptions as a %age Completed Jobs	61.8%

Table 2 – Quarter 4 Reporting Levels

7. Transco's number of successfully reportable interruptions has more than doubled from quarter 1 to quarter 4 of 2003/4.

Quarters 2003/4	Number of successfully Reported interruptions
1	29183
2	39433
3	54254
4	69736

Table 3 – Successfully Reported Interruptions

8. Until a few months prior to the audit, Transco had concentrated more on error correction to achieve this improvement. Less attention had been given to checking the quality of information that satisfied the validation criteria, but contained inaccurate data. Examples of this are jobs of very long or very short CML, which suggest errors may be present and, if so, have an adverse effect on the accuracy of CMLs reported.

9. Such jobs can be identified for additional scrutiny by exception reporting on data collected successfully at the Data Warehouse. During the review Transco was considering this for implementation. The parameters for reporting could, at a more detailed level, also include those CMLs falling outside a reference range of CML times according to STORMS job types.

10. Additionally, routine internal audit of jobs in the Data Warehouse would strengthen Transco quality initiatives.

11. Based on the audit team's opinion of the CI data reported by Transco to Ofgem, Transco's own comments on that data, and the measures taken by Transco to improve data quality since implementation of the RIGs in April 2003, two reporting periods were chosen for sampling. These were the quarters ending December 2003 and March 2004. It was the view of the audit team that the data for these two periods should reflect more closely the current quality of data collected by Transco and reported to Ofgem. This choice also recognised the impact, during the earlier quarters, of process changes related to CI reporting and the additional training and support needs identified for some personnel following implementation of these new CI data collection requirements for the RIGs.

3.3.1.2 Data Collection into Transco Systems

1. Interruption start and end times should be recorded by the Transco representative who turns the gas supply off and the person who turns the gas supply back on at the customer's emergency control valve (ECV).

2. If a Customer is requested to turn the ECV off when reporting an escape to one of Transco's Emergency Call Centres that time will be recorded as the start time in EMW. The status of the ECV will be confirmed

when Transco attend site and the start time can be amended if appropriate. The interruption start time can also be generated by the site arrival time of the emergency engineer if the ECV has not been closed. This is an automatic date and timestamp on the system.

3. In the case of a multiple loss of supply from a single cause the start time is the time logged by the Call Centre from the initial report.

4. Transco's Distribution staff and contractors, who normally carry out work upstream of the ECV, record their job details in the STORMS system. Historically, these details have been recorded first on paper job cards for later entry into the electronic system. However, in 2003, implementation of an electronic field system for STORMS called Quarterback 5 (QB5) commenced and this was continuing during the audit.

5. Transco's Service Engineers, who normally carry out work downstream of the ECV to the appliances, and contractors Service Engineers, record their details in the EMW system. The Transco Service Engineers record their job details via portable field terminals and the contractors, who are normally supporting service replacement, record their details on paper job cards for later entry into the electronic system.

6. Where CI end times are captured in EMW, a STORMS reference has also to be recorded in EMW to enable that CI data to be found in the Data Warehouse so that the CML to be calculated.

7. For an end time recorded in EMW to be found in the Data Warehouse, the end reason given in STORMS must be the one that indicates that a purge and relight of appliances is required, otherwise the data will not be associated.

8. There is validation of data entered in QB5 and STORMS against defined parameters - for example, the end time is after the start time. However, this cannot obviate the possibility of logical but inaccurate data capture that will either result in a CI not being identified in the Data Warehouse or incorrect recording of CI times.

9. The flow of data is illustrated in Fig1 on the following page.

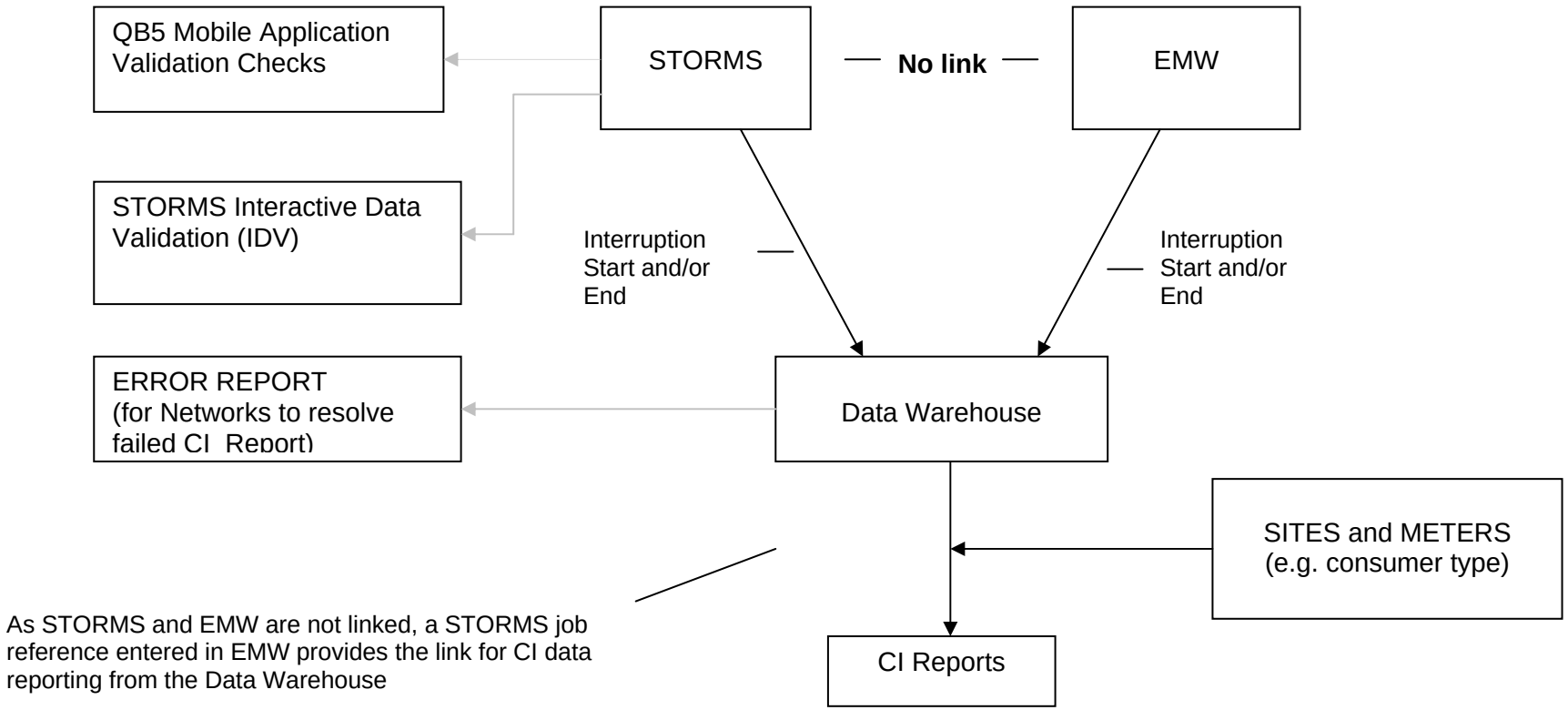

Figure 1 - CI Data Flow

3.3.2 Accuracy of 2003/4 CI Data Audited

1. Tables 4 to 7 below give summaries of errors found for the quarters sampled.

London Network

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	5	2	40	5	100
	LE	5	3	60	3	60
Planned	SA	2	0	0	0	0
	SR	9	4	44.4	9	100

Table 4 - Quarter 3 Sample

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	5	2	40	3	60
	LE	6	2	33	2	40
Planned	SA	2	0	0	0	0
	SR	8	2	25	8	100

Table 5 - Quarter 4 Sample

Scotland Network

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	7	1	14.3	0	0
	LE	6	4	66.7	0	0
Planned	SA	7	1	14.3	0	0
	SR	10	5	50	4	40

Table 6 - Quarter 3 Sample

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	7	2	28.6	1	14.3
	LE	7	4	57.1	2	28.6
	MF	6	0	0	3	50
	NM	1	0	0	0	0
Planned	SA	7	3	42.9	0	0
	SR	10	2	20	6	100

Table 7 - Quarter 4 Sample

2. Table 8 gives a summary by quarter and category of the errors found for London and Scotland Networks.

	% Error Found in Sample			
	London		Scotland	
Interruption Category	Quarter 3	Quarter 4	Quarter 3	Quarter 4
3P	40	40	14.3	28.6
LE	60	33	66.7	57.1
MF	NA	NA	NA	0
NM	NA	NA	NA	0
SA	0	0	14.3	42.9
SR	44.4	25	50	20
All Unplanned	50	36.4	38.5	28.6
All Planned	36.4	20	35.3	29.4
All Categories	42.9	28.6	36.7	28.9

Table 8 - Error Summary by Quarter and Category

3. Overall, the types of errors found were:

- STORMS WR reference linking unrelated EMW jobs. I.e. different EMW addresses linked by a STORMS WR reference, resulting in an incorrect CML calculation.

- Gas available at Exit point in accordance with the RIGs definitions but not recorded as such in STORMS – interruption time calculated from the EMW end time. E.g. longer interruption calculated when a later EMW end time for a purge and relight requested by the customer is used.

- Details captured on one STORMS job (normal practice prior to the RIGs) whereas two are now required to capture separately service relay and service transfer interruptions within a relay project. E.g. the start time of the initial service relay to the existing main linked to the end time of the later service transfer to the replacement main exaggerates the overall interruption time reported, instead of capturing two shorter interruptions.

- Incorrect interpretation of EMW data by the error correction team. E.g. the error correction team uses available data in order to amend as accurately as possible interruption reports that have failed at the Data Warehouse. Human error can occur in this process whereby the logic of the data is accepted at the Data Warehouse but the data is still incorrect, in turn leading to inaccurate interruption calculation.

- Job not a reportable interruption. E.g. work falling outside the RIGs definitions for reporting but carried out under a STORMS job type normally relevant for reporting.

- Job end time recorded in STORMS instead of interruption end time.

E.g. the physical end time of the whole job including work, after the end of interruption is also recorded on the STORMS job card and this time may be entered in error in the interruption section.

- Error in transcribing STORMS data. I.e. data from the STORMS job card is entered incorrectly into the STORMS system.

4. Appendix L provides a more detailed analysis of the Customer Interruptions samples and error information.

5. Using the results across all interruption categories, errors in the samples for both Networks were found to have reduced from Quarter 3 to Quarter 4. In London, these errors reduced from 42.9% to 28.6% and in Scotland from 36.7% to 28.9%.

6. No errors were found during the review when comparing data held in EMW and STORMS with that held in the Data Warehouse.

7. No difference was found in the treatment or recording of CI data associated with different Consumer Types or Priority coding. The provision of priority customer data from Suppliers is outside Transco's control and can be unreliable. As mentioned previously, Transco's practice, confirmed by both Transco's staff and contractors, is to assess priorities on site and to order re-commissioning of supplies accordingly.

3.3.3 Interpretation of Customer Interruption RIGs Definitions and Compliance with Reporting Requirements

1. The RIGs came into effect in April 2002 and were agreed as part of the last price control review.

2. A copy of the template used by Transco for the reporting of interruptions is contained in Appendix I. This report is generated from the Transco Data Warehouse using a software application, Business Objects, which loads the data into a Microsoft Excel spreadsheet.

3. In Section 2 of the RIGs document the guidance indicates that:-

- The number of non contractual Network supply interruptions and
- The duration of non-contractual Network supply interruptions

be reported.

4. Further details of exact requirements are contained in Section 3.3.4.

5. From the evidence provided in the form of the actual interruptions reports and the covering letters Transco comply with reporting timescales. The covering letter to the quarterly report, for example, provides an opportunity for Transco to qualify the report's contents by making appropriate comment on progress with data quality issues. The RIGs Customer Interruptions descriptions are provided in the following table:

Ofgem Category	Interruption Value	Engineering Work
Consumer / shipper initiated service alteration	SA	Planned.
Consumer initiated mains Diversion	MA	Planned
Transco initiated	SR	Planned
Leaking services	LE	Unplanned
Mechanical Pipe/ Plant Failure	MF	Unplanned
Non-mechanical Pipe/Plant Failure	NM	Unplanned
Third party action	3P	Unplanned
NTS (upstream failure)	UF	Unplanned
1 in 20 conditions exceeded	EV	Unplanned
Inadequate Network Capacity	IN	Unplanned

Table 9 - RIGs Definitions of Non-contractual Interruptions

6. The following table gives the Transco description for the STORMS job codes that cover planned and unplanned interruptions.

Code	Description	Planned	Unplanned
ERM	Escape Repair Main		x
ERMD	Escape Repair Interference Main		x
ERS	Escape Repair Service		x
ERSD	Escape Repair - Interference Service		x
SA	Service Alteration	x	
SAO	Service Alter, Operations Reasons	x	
SEDL	Domestic Relay following gas escape		x
SO	Service Other	x	
SPDL	Domestic Relay - Mains Replacement	x	
SPDM	Domestic Relay Mains Replacement	x	
SRAD	Service Renewal following alter/divert	x	x
SRB	Service Relay - Bulk Domestic	x	
SRC	Domestic Relay Selective Condition	x	
ST	Service Transfer	x	

Table 10 - Transco Interruptions STORMS Job Descriptions

7. It would appear that Transco reporting meets RIGs definitions although, as identified elsewhere, the accuracy of data provided is uncertain.

3.3.4 Reporting Customer Interruptions into Ofgem's Template

1. A copy of the final quarter Customer Interruptions report is included in Appendix I for reference. The review found that this format met Ofgem requirements with regards to the reporting of customer interruptions in relation to content.

2. In summary the requirements of RIGs for reporting and levels of disaggregation are as follows:

- The overall number and duration of non-contractual interruptions
- The number and duration of non-contractual interruptions in each Network
- The number and duration of non-contractual interruptions in each Network for domestic, non- domestic, priority and CSEP consumers
- The number and duration of planned non-contractual interruptions in each Network
- The number and duration of unplanned non-contractual interruptions in each Network
- The number and duration of non-contractual interruptions in each Network resulting from each planned activity listed in the Table 9 in Section 3.3.3
- The number and duration of non-contractual interruptions in each Network resulting from each unplanned activity listed in Table 9 in Section 3.3.3

3. Major incidents are listed separately and are defined as events which affect 250 or more Network supply points.

4. From the quarterly reports submitted to Ofgem in 2003/2204 the reporting format was seen to comply with RIGs requirements. A copy of one of these reports is contained in Appendix I.

5. The data and arithmetic within the reporting format were checked by additional calculations within the original spreadsheets used and these were found to be accurate with the exception of small and insignificant rounding errors, such as rounding to the nearest minute for the duration of an interruption. Data that appeared in a number of different places within the spreadsheet was consistent

6. In conclusion the number and duration of interruptions is correctly reported in the format and with the contact and breakdowns required. The actual accuracy of the numbers in relation to actual total interruptions and durations is addressed elsewhere.

7. The accuracy and the wide variations between Networks for comparable activities are discussed in Section 3.3.1.

3.4 REPEX

3.4.1 Accuracy of REPEX Data Reporting Systems

1. Transco has a robust system for recording work carried out on its Network – STORMS. Details of new assets are automatically transferred to TEAR when the STORMS work request is closed. All new assets are given a unique asset ID by TEAR.

2. For new mains an asset ID will refer to a pipe of one diameter, one material and one pressure rating in a street or between two points (tee, reducer, cap end or valve), whichever is the shorter length. Mains asset IDs are recorded on Transco's digital record system as a separate layer and can be added to any drawing as necessary.

3. Existing mains data was transferred into TEAR from the twelve regional 'Management Information iN Engineering' (MINE) data systems when the previous mainframe computer systems were shut down in 1998/1999. The mains data was originally digitised from the manually updated drawings in the late 1970s using mostly contract resources and there is a possibility that some of this data is not totally accurate.

4. These historic inaccuracies could explain the minor differences between the lengths of some mains units provided by Transco Centre and those recorded locally, which gave an under reporting of decommissioned mains length of 0.32% on the projects reviewed (see Appendices B and D). There is a Transco procedure – DR4 - for reporting differences between the recorded mains details and those found on site, but this is only required to be used if the discrepancy is greater than 5%.

5. New services are given an asset ID for the length from the main to the property boundary and second asset ID from the boundary to the ECV at the meter position. Only low pressure services 63mm in diameter or above and medium pressure and intermediate pressure services of any diameter are recorded on the digital record system, so most new services are only recorded in TEAR.

6. Nationally most replacement work is carried out by period contractors rather than Transco's own direct labour force. In the two Networks visited contractors carried out more than 80% of replacement work. The new period contracts require the whole project to be complete, with all work requests returned and as laid drawings provided before any payment is made. This ensures that the contractor quickly returns all the documentation once work is finished.

3.4.2 Accuracy of REPEX Reporting Audited

3.4.2.1 Summary of Findings

Thirty projects were reviewed during the two Network visits. In general the work carried out was recorded accurately in STORMS. However there was a discrepancy of –0.32% between the lengths of the mains asset IDs decommissioned contained in the spreadsheet issued by Transco Centre and the work requests recorded locally. As the figures from Transco Centre are those submitted as part of RIGs reporting, Transco appear to be slightly under reporting the length of main decommissioned.

3.4.2.2 Mains Decommissioned

1. Twelve projects totalling 12,466m of decommissioned main were reviewed in the London Network. Of these, six had some discrepancies between the lengths of mains asset IDs decommissioned as described in Section 3.3.1. These discrepancies amounted to –0.06% of the length of main decommissioned in the sample. One project (Northaw Road West, Northaw) had all work requests completed even though a 25m length had to be reconnected due to pressure problems. The final connection for the project is planned for summer 2004.

2. Eighteen projects totalling 11,417.5m of decommissioned main were reviewed in the Scotland Network. Of these, twelve had some discrepancies between the lengths of mains asset IDs decommissioned as described in Section 3.3.1. These discrepancies amounted to –0.63% of the length of main decommissioned in the sample.

3.4.2.3 Mains Replaced

1. The twelve London Network projects reviewed included the laying of 11,728.5m of main. The Northaw Road project mentioned in Section 3.4.2.2 included a 25m length of 250mm PE main, out of a project length of 1,453m, which was not laid due to pressure problems even though the work request had been completed.

2. The eighteen Scotland Network projects reviewed included the laying of 8,052.6m of main. No discrepancies between the work completed and that recorded were found.

3.4.2.4 Services Replaced

1. The London Network projects reviewed included the replacement of 390 domestic and 11 non domestic services. From the service details provided and the proposal drawings seen the audit team considered that this number seemed reasonable and no apparent anomalies were found.

2. The Scotland Network projects reviewed included the replacement of 355 domestic services, but no non domestic services. From the service details provided and the proposal drawings seen this number seemed reasonable. However in one project (Appin Crescent Dunfermline) no service replacement or transfer records could be found on STORMS for house numbers 60 to 110. This indicates that this project may have under reported the number of services replaced or transferred by up to 25.

3.4.2.5 Services Transferred

1. The London Network projects reviewed included the transfer of 500 PE services to newly laid mains. From the service details provided and the proposal drawings seen, the audit team considered that this number seemed reasonable and no apparent anomalies were found.

2. The Scotland Network projects reviewed included the transfer of 346 PE services to newly laid mains. From the service details provided and the proposal drawings seen, the audit team considered that this number seemed reasonable and, apart from the Appin Crescent query raised in Section 3.4.2.4, no apparent anomalies were found.

3.4.2.6 General Points

1. There were differences in operating practise:-

- Scotland Network raises one work request for every mains unit decommissioned or laid. The audit team considered that this increases the admin burden as the raising and closing of work requests on STORMS can be time consuming. London Network uses multiple construction units (one construction unit per mains unit) on both decommission and relay mains work requests. This is how STORMS is designed to operate.

- Scotland Network splits projects into phases in order to speed payment to contractors. This makes it very difficult to audit the work completed, as the split is often arbitrary and can lead to mains in one phase and the attached services in another. The Network has recognised the problems that this phasing caused and at the time of the audit was changing the practise. This will make it easier to control the work and audit the completed projects in the future.

2. The as laid drawings produced by AMEC, London Network's contractor in the Slough area, were very detailed. Every mains unit decommissioned or laid was labelled with the correct mains asset ID, making it very easy to cross check that the work was recorded accurately.

3.4.3 Interpretation of REPEX RIGs Definitions and Compliance with Reporting Requirements

1. In summary, Section 5 of the RIGs requires Transco to report the following mains replacement statistics to Ofgem detailed in Table 11 by Network and in aggregate for the whole of Transco.

Mains Decommissioned (Internal diameter - inches)	Mains Decommissioned (Km)	Replacement Mains Installed (External Diameter - mm)	Replacement Mains Installed (Km)
2-3"		</= 75mm	
4-5"		>75-125mm	
6-7"		>125-180mm	
8-9"		>180-250mm	
10-12"		>250-355mm	
>12"		>355mm	

Table 11 – REPEX Reporting Format

2. Under the RIGs Transco is not required to include details on mains decommissioned that are constructed of polyethylene or cathodically protected steel.

3. In addition to the mains details above, Transco is also required to provide data in relation to services replaced and transferred as detailed below:

- The total number of replacement non-domestic services installed per year

- The total number of replacement domestic services installed per year
- The number of replacement domestic services installed in association with mains replacement per year
- The number of replacement domestic services installed as a result of leakage per year
- The number of replacement domestic services installed for reason of condition (where no associated mains replacement takes place) excluding leakage per year

3.4.4 Reporting REPEX Data into Ofgem's Template

1. The 2003/2004 REPEX and supplementary information report was not available for the audit as it is not due to be reported until the end of July 2004. In general, the audit team considered that the REPEX and supplementary information provided by Transco for 2002/2003 meets Ofgem's requirements.

2. However, although the numbers of rechargeable diversions, both Local Transmission System (LTS)/NTS and below 7 bar in total and by Network, have been reported as required, the length of below 7 bar diversions has not.

3.4.5 Conclusion

1. Transco has a robust computer system (STORMS) to record all work carried out on its network and in the sample audited the mains as laid details were input correctly.

2. The service laying details recorded were compatible with the layout and length of the mains replaced. However as all properties do not have a gas service, it was not possible to confirm that all service work was recorded correctly.

3. Due to past problems with the original digitisation of the mains records, there are errors in TEAR that can result in minor discrepancies in the length of abandoned mains units reported. In the sample audited this amounted to an under reporting of 0.32%.

3.5 ASSESSMENT OF TRANSCO TRAINING PROVISION AND ACTION PLANS

Three areas were looked at regarding training and action plans. These were: the two Networks of Scotland and London, and the Network Policy team at Transco Centre.

3.5.1 Assessment of Training Provision

1. As the computer system and procedures for reporting of REPEX activity were already well established, Transco's training effort was concentrated on customer interruptions.

2. Transco stated that training packages were prepared centrally covering the requirements of the RIGs, the procedures being introduced to ensure accurate reporting and the possible consequences of failing to do so. These were presented to nominated representatives from the Networks, Call Centres, Emergency Services and Fulcrum Connections as a 'train the trainer' exercise. These representatives then briefed the relevant first line managers from each section involved with customer interruptions. The first line managers were responsible for briefing the staff under their control at team briefings. Contractors' managers were included in these briefings and then expected to brief their own staff.

3. The audit team examined a selection of briefing records to ensure that all staff had in fact been briefed. In general the operational record sheets were all signed by the staff, whereas a number of sheets for EMS operational staff were endorsed 'left in pigeon hole' for the recipients of the information. In the latter case there is a possibility that the benefit of the information may not have been adequately communicated to the intended recipient.

4. Transco office and operational staff spoken to by the audit team showed a good understanding of the RIGs requirements and reporting procedures. The contractors' managers also showed a good degree of understanding. Although the contract service engineer the audit team met at Slough had not heard of RIGs but knew the importance of accurately recording the gas off and on times.

5. Training material was originally developed at Transco Centre. A "train the trainer" approach was applied, where key staff at each Network were trained in order that they could pass on this training to the relevant front line staff.

- Specific training was provided for:
    - Engineering Teams (STORMS & QB5)
    - Network Office (STORMS & QB5)
    - Transco Emergency Service (E&MW)
    - Fulcrum Connections
- Supplementary training materials were then produced following post implementation review of Data quality.
- Separate training was provided for error resolution, together with an error guide.

6. Both Networks visited understood that the training material supplied from Transco Centre was adaptable to suit their particular Network needs.

7. Transco Centre was also able to identify individuals at Call Centres who caused persistent problems so that remedial action could be undertaken via Management Information (MI) produced from the work management systems. For other teams, errors are reported at First Line Manager level.

3.5.2 Assessment of Action Plans

1. In addition to the interruption workshops previously mentioned, the Networks visited include RIGs data quality issues in the normal regular staff meeting cycle. These are attended by First Line Managers and their teams and are intended to improve the feedback process, share best practice and generally improve RIGs data quality.

2. The Action plans produced by Transco Centre and the Networks are intended to be dynamic documents reflecting the learning from all sources and changing pressures and timescales. Typically they include the following areas:

- Interactions with other organisations or sections i.e.
    - Fulcrum Connections
    - Operations Support
    - Repair
    - Replacement
    - Contractors
- Monitoring
- Management Information

- Communications
- Resources
- Skill & System gaps
- Error backlog
- Audit & review

3. Both Networks and Transco Centre had developed their own individual action plans. There are common themes, but the action plans have been tailored to their individual circumstances. In the Networks some aspects of the action plans, such as error clearance, had only just been implemented and at the time of the audit is was difficult to see how effective these changes had been.

4. SUMMARY OF AUDIT RECOMMENDATIONS

4.1 OVERVIEW

A number of issues came to light during the course of the audit: -

- Lack of integration between computer systems – STORMS and EMW
- Uncertainty about future plans for computer system used by those Networks that may be sold
- The requirement for reporting activities that Transco feels to have little or no business or consumer benefit
- Amount of resource available at Transco Centre and in Networks needed to administer the interruption process, including error correction where necessary
- The difficulty of working to three definitions of an end of interruption –
  - Re-commissioning of consumer appliances (where it is safe to do so)
  - Notification to the consumer's address that gas can be restored to the premises when access can be arranged
  - Notification to the consumer, or to the consumer's address, that there are considerations outside Transco's control (in the absence of which the gas supply could be restored to the premises) which prevent restoration of supply, following notification from Transco that the gas supply could be restored the consumer requests that restoration is delayed or reconnection is subject to the resolution of a dispute

4.2 RECOMMENDATIONS TO TRANSCO

The covering letter to the quarterly report provides an opportunity for Transco to qualify the report's contents by making appropriate comment on progress with data quality issues. It is the view of the audit team that Transco, whilst not having any specific requirement to do so under the RIGs, should qualify the data submitted to Ofgem, in a manner consistent with reporting on RIGs internally to its own governance requirements.

4.2.1 Interruption Data Source

1. STORMS can give an accurate count of the number of interruptions in all reportable categories. The audit team suggests that Transco gives consideration to using STORMS to give the times as well, as the relevant fields already exist.

2. This would require a change in operating procedure with the distribution team leader completing both the 'off' time from information given by Transco's First Call Operative (FCO) on arrival on site and the 'on' time by a telephone call if the team has already left site. Both the 'off' and 'on' times would also be recorded on EMW, allowing for an auditable trail.

4.2.2 Error Correction

1. There is currently a great effort being put into the retrospective clearing of errors. The audit team considers that it would be more cost effective if staff resources were biased more to support efforts to reduce occurrence of these errors.

2. As an example, the Hillingdon Operational Unit (OU) in Scotland tied up the manual EMW voucher with the STORMS Work request to ensure the interruption times were present and correct before passing the paperwork to the Glasgow office for input.

3. In another example, the London Network has changed from data inputting by a central team to inputting by the operational function. This has led to a greater ownership of data accuracy by the individual operational teams.

4.2.3 Exception Reporting

1. There was no evidence found of sense checking of the length of interruptions at any stage before the RIGs report is submitted to Ofgem. During the audit, examples were discovered of interruptions over 100,000 minutes being recorded for service relays that had been validated by the various computer systems. Such rogue results adversely affect the average interruption time reported.

2. The audit team recommends that Transco determines standard maximum and minimum durations for an interruption associated with each relevant STORMS job type. Routine Business Objects reports to highlight unusual interruption durations should be run, so that these can be investigated and corrected, if appropriate, before the quarterly reports to Ofgem are produced.

3. Ninety percent was the reference rate given as guidance to staff in Scotland regarding anticipated incidence of the interruption End Reason "purge and relight has been requested" to be recorded in STORMS. Where there is wide variation from such a reference may be an indication that recording rules are not being followed. The audit team recommends that Transco monitor such variations against an appropriate experience–based reference percentage as additional support to support data quality control.

4.2.4 Improvements in Training and Data Handling

The audit team suggests that Transco needs give more focus to the training of both operational and office staff on the importance on the correct input of interruption times on paper and computer systems. More sampling to check understanding by Transco staff and Contractors of the RIGS requirements and to assess their compliance in the field needs to be undertaken.

4.2.5 Action Plans

Action plans, for both Transco Centre and Networks, need to be robust, dynamic and focussed on delivery of improvement. The link between the creation and delivery of these action plans and Transco's governance processes may require further review in order to clarify the place of RIGs data quality within Transco's business priorities and resource allocation. Best practice needs to be identified quickly and taken up by the other Networks. Constraints on wider use of best practice should be documented as part of the record of action plan delivery to be reported into the governance process for further review at appropriate levels within Transco.

4.2.6 Management Responsibilities

1. The audit team suggests that the Network Management Teams need to own the requirement of RIGs reporting and manage its successful delivery.

2. It is the audit team's view that Transco should issue clear guidance on the introduction of future computer systems, although this may be difficult with the possible sale of up to four Networks imminent.

4.2.7 REPEX Data Source

Replacement data is taken from TEAR and there can be a discrepancy between the decommissioned length reported by Centre and that input in the Networks, as described in Section 3.4.2. From the sample seen during the audit, this indicated an under reporting of 0.32% on the length of mains decommissioned. The audit team suggests that Transco should take steps to ensure that lengths reported from TEAR are those input by the Networks.

4.2.8 Fulcrum Connections

Fulcrum Connections carry out a small proportion of interruptions connected with service alterations and this work is currently recorded on STORMS. However the replacement for STORMS currently being introduced by Fulcrum Connections may well have some impact on the production of interruption data. The audit team recommends that Transco holds early discussions with Fulcrum Connections to assess the possible impact.

4.3 RECOMMENDATIONS TO Ofgem

4.3.1 Future Audit Framework

1. This has been the first audit on the reporting of RIGs data by Transco. As such it has proved to be a learning experience for all the parties involved, Transco, Ofgem and Wilcock Consultants.

2. As the sale of four Transco Networks is imminent, the audit team recommends that future audits are carried out in a sample of Transco's remaining Networks and in at least one of each group of Independent Networks to ensure fairness in the treatment of all Distribution Networks.

3. Although the audit team is satisfied with the way the audit structure worked this year, it is recommended that the audit structure be reviewed and adapted, as appropriate, prior to the first audit that includes Independent Networks.

4. Bearing in mind that many of the corrective measures instigated by Transco recently to improve the level and quality of Interruptions reporting have possibly not yet flowed through to the actual reports submitted so far, the audit team suggests that a further audit targeted at the accuracy of the measurements be considered when the first two quarters of 2004/2005 have been reported. This could be of a shorter duration and purely focussed on the analysis of interruptions data.

5. The approach to CI sample selection for this audit has been described in Section 2.3.1.1. The audit team recommends that for future audits the sample should comprise a representative number of CIs generated by each STORMS job type within each interruption category. This would however be subject to a preliminary assessment of data quality as for this audit. As a consequence, an increase may be required in the number of interruptions investigated to ensure that an adequate sample is studied.

6. The value of further stratification of STORMS jobs data to reflect work content and other parameters influencing CI duration in order to achieve more meaningful interpretation of CML and inter-Network comparisons will require further discussion and agreement between Transco and Ofgem.

7. A proposed audit framework is detailed in Appendix K.

4.3.2 Interpretation and Modification of RIGs

1. Transco can produce data from STORMS on the number of jobs from which one or more interruptions arise. It is problems with recording data correctly in order to link information in STORMS and EMW that are the main source of failure to report actual numbers of CIs and their CMLs. The audit team recommends that Ofgem gives consideration to amending the RIGs definition of the end of the interruption to be 'gas available at the ECV. This would allow all the necessary data to be captured on STORMS alone. If this amendment is implemented then Ofgem may wish to consider the introduction of a new element, the time taken for the completion of Purge and Relight activities following a customer request or a request from an engineering team. This latter activity is completed within the EMW system with start and completion times.

2. Emergency work in high rise and multi occupancy buildings can cause longer than usual interruptions that are often outside Transco's control, as third parties such as landlords and local planning authorities are involved. The audit team suggests that Ofgem gives consideration to allow reporting of such interruptions separately in the same way that major incidents currently are.

3. The audit team suggests that Ofgem gives consideration to requiring the exception reporting of the numbers of interruptions that exceed certain CMLs e.g. 24 hours. This reporting could be completed in bands and should further incentivise Transco to produce and action their own exception reporting and to investigate problem areas.

4. The audit team recommends that more regular joint Ofgem/Transco reviews are carried out to discuss any anomalies in interruption durations. Visits by the relevant Ofgem staff to all Networks would allow them understand in greater detail the individual operational environments.

5. The audit team suggests that Ofgem should hold further discussions with Transco to agree a better structure for interruption and REPEX data reporting that reflects methods and data more relevant to business performance drivers and improved levels of customer service.

6. As during any transitional period following the imminent Network sale Transco systems will continue to be used, the audit team recommends that Ofgem hold discussions with Transco and the new Independent Networks to ensure that there is full co-operation in the production of the RIGs information. This could include the RIGs data being produced centrally by Transco.

5. LESSONS LEARNED

5.1 OVERVIEW

As mentioned earlier, the audit was seen as a joint Transco, Ofgem and audit team exercise and this Section presents the lessons learned during the course of the audits. It therefore includes lessons learned from every aspect of the work, including experiences gained through the audit procedure and comments made by staff in the Networks and Transco Centre. This Section covers lessons learned on all aspects of the audit framework.

5.2 TIMING OF AUDITS AND RESOURCES

1. The timing of the audit during May meant that all data for the financial year 2003/2004 was available, although replacement data is not reported to Ofgem until the end of July. This gave the audit team a chance to look at the complete picture. It is recommended that future audits take place during May or June.

2. The four days spent in each Network was just about long enough to investigate their understanding of the RIGs reporting requirements and analyse the samples of interruptions and decommissioned mains selected. However if the number of interruptions to be investigated increases as indicated in Section 4.3.1 the time spent in the Network or the number of auditors may need to increase.

3. It is considered that the fact that the audit team completing this audit had extensive experience and knowledge relating to Transco engineering activities and systems proved to be of benefit. This meant that little time needed to be spent familiarising team members with background knowledge and that more detailed investigations were possible with regards to the actual physical completion and recording of information.

5.3 ACCURACY OF MEASUREMENT

5.3.1 Accuracy of Customer Interruption Measurement

1. Because of the approximations reported, the use of a reporting accuracy of the nearest minute is of limited significance for most jobs. The question is posed, “Do these approximations have a detrimental impact on the customer in terms of efficient balance of standards of service achieved, usually as a result of direct interaction with the customer, and the requirement to report on performance?” Other questions flow, such as:

- What are the tolerances that should reasonably apply?
- Should these tolerances be weighted according to job type and job CML?
- Should these tolerances be standard for all jobs regardless of CML?
- Is there value in taking an alternative snapshot of performance, with similar approximations but potentially greater reporting success?
- How do the results sit with other information available regarding drivers for optimum customer service, job duration and cost?

2. These should be matters for further consideration between Ofgem and Transco before the next full audit.

5.4 AUDIT OF INTERRUPTION REPORTS

The auditing of some of the reports requires relatively subjective interpretation, as explained in Section 2 of Appendix L. Therefore given this subjectivity it should be noted that the assessment of CML accuracy for many jobs can only be regarded as qualitative and actual values are very difficult to assess.

5.5 AUDIT OF REPEX REPORTS

1. The method of auditing the REPEX reports was deemed to be adequate as the checklist used seemed to cover all aspects of the reporting criteria. However, it was not possible to check that the lengths recorded on the projects sampled flowed though the Transco IT systems into the final RIGs report to Ofgem, as this report is not due to be run until the end of July.

2. Not all the project files presented contained all of the information requested and time was wasted as the Network staff retrieved the missing papers.

3. Access to STORMS and MAPS (an online digital mapping system) is essential. Computers and the experienced staff needed to access the systems were not available all the time. This meant that the audit team had to work on other aspects of the audit until the appropriate staff were available.

4. The audit relied on examining the paperwork in order to check that details from the work requests were recorded accurately. In order to verify that these lengths are correct it would be better if future audits included at least one site visit to measure the actual length of a complete project. However this would increase the time required for the audit.

5. The audit targeted replacement main projects, and the methodology used did not check the accuracy of the returns for decommissioned services not replaced, services replaced after leakage or services replaced due to condition. Future audits should include these categories.

5.6 ANALYSIS OF AUDIT RESULTS

The high error rate in reporting and the inconsistencies in interruption duration highlighted earlier made it very difficult to analyse the audit results in a meaningful way. Once there is a greater degree of confidence in the data reported a standard, less intuitive approach could be applied to both sampling and analysis.

5.7 FUTURE WORK

The two Network visits provided a snapshot of Transco's compliance with the RIGs reporting requirements. In addition, Fulcrum Connections carry out all service alterations and any associated service replacement work, so thought should be given to a small-scale audit in one of their area offices in order assess practice there, particularly as they are introducing a new work management system to replace STORMS.

6. CONCLUSION

1. Transco has systems in place to record both customer interruption information and replacement data. However, data collection errors have adversely affected the quantity of interruptions recorded successfully and the quality of the customer interruption data reported to Ofgem under the RIGs

2. Across all interruption categories, data errors affecting accuracy of CMLs reported in the samples for the two Networks audited were found to have reduced from Quarter 3 to Quarter 4 during the reporting year April 2003 to March 2004. Overall in London Network, these CML errors reduced from 42.9% to 28.6% and in Scotland from 36.7% to 28.9%.

3 Transco carried out a programme of training for its staff and key contractors for the introduction of the RIGs and members of Transco staff met by the audit team were aware of the requirements for RIGs and understood the issues concerning data quality relevant to their work. Transco has also implemented action plans for further reduction of CML related errors on its systems and, consequently, expects an improvement in the quantity and quality of data for future reports. Subject to continued support by Transco management, in terms of business priorities and resources made available, the audit team agrees that, progressively, further improvements in data quality will be achieved.

4. Investigation of 12 replacement projects in the London Network and 18 in the Scotland Network showed that there was a high level of accuracy in reporting, with the length of main decommissioned under reported by 0.32%. This seems to have been caused by discrepancies in the TEAR records resulting from the original digitisation of the mains records.

5. The audits highlighted a number of improvements that could be made by Transco to improve the accuracy of the information reported to Ofgem. Some recommendations on the revision of RIGs are made to Ofgem.

6. A future audit framework is proposed, but the final structure of this audit framework is contingent on the outcome of a further review by Ofgem and Transco of the job parameters to be considered by the audit in order to make meaningful assessments of CMLs and cross-Network comparisons. Review of the implications of change of ownership of some of Transco's Networks on data collection and reporting is also required in respect of transitional and subsequent arrangements.

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX A

LONDON NETWORK

SAMPLE LISTS

INTERRUPTIONS

RIGs Review Sample CIs London Period 5

Interruption Category	Number	Job Type	Consumer Type	Priority	Originating EMW Reference	STORMS reference	PUR Reference	Reported Duration
3P	1	ERSD	D	N	55088036	4472994	55329719	994
3P	2	ERSD	D	N	55079317	4500735	55353059	12987
3P	3	ERSD	D	N	55336862	4518300		60
3P	4	ERSD	D	N	55020349	4455951	55024909	333
3P	5	ERSD	D	N	55011108	4493101	55551386	196
3P	6	ERSD	I	N	55053517	4500843	55561636	146
3P	7	ERSD	D	N	55474672	4546348	55655128	19086
3P	8	ERSD	I	N	55570754	4593881	55890171	40
3P	9	ERSD	I	N		4627742	55851214	1111
3P	10	ERSD	D	N	55490718	4578138	55784962	2
LE	1	ERS	D	N	55081683	4500810		206
LE	2	ERS	I	N	54957872	4470388		150
LE	3	ERS	D	N	55314054	4522658	56708084	65131
LE	4	ERS	D	N	55252614	4501673		80
LE	5	ERS	I	N	55091808	4502750	12723446	4369
LE	6	SPRE	D	N	55576541	4624064	56530374	20041
LE	7	SEDL	D	N	55929316	4647064	56530166	7453
LE	8	ERS	D	Y	55389105	4530436		170
LE	9	SPRE	D	N	55513991	4582394	56544618	458
LE	10	ERS	D	Y	55338478	4879973	57314242	164283
SA	1	SA	D	N		4325339		84
SA	2	SA	D	N		4337986		239
SA	3	SRAD	D	N		4418631		419
SA	4	SA	D	N		4344210		539
SA	5	SA	D	N		4373537		59
SA	6	SA	D	N		4394737		460
SA	7	SA	D	N		4392312		599
SA	8	SA	D	N		4347718		59
SA	9	SA	D	Y		4436016		359
SA	10	SA	D	Y		4474288		100
SR	1	SO	D	Y		5025344	12473698	60
SR	2	SPDL	D	Y		4529001	12474336	45070
SR	3	SPDL	D	Y		4473716	12473786	1760
SR	4	ST	D	Y		4026070	12473126	180
SR	5	SPDL	D	N		4696858	56336417	525
SR	6	SPDL	D	N		4407819	56174382	150
SR	7	ST	I	N		4186323	56175090	150
SR	8	SDNL	D	N		4108218	56190645	1590
SR	9	SRNL	D	N		4553028		95
SR	10	SRNL	D	N		4028336	12474016	1985

RIGs Review Sample CIs London Period 6

Interruption Category	Number	Job Type	Consumer Type	Priority	Originating EMW Reference	STORMS reference	PUR Reference	Duration
3P	1	ERSD	D	N	56596645	4791593		20
3P	2	ERSD	D	N	56364543	4733434		60
3P	3	ERSD	I	N	56323778	4738759		256
3P	4	ERSD	D	N	56431373	4751308	56904187	1472
3P	5	ERSD	D	Y	56475683	4762656	56903508	256
3P	6	ERSD	D	Y	56399015	4744105	56925141	361
3P	7	ERSD	D	N	56557905	4779878	57005228	2966
3P	8	ERSD	D	Y	56425286	4750399	57000639	1215
3P	9	ERSD	D	Y	56474142	4762051	57260289	349
3P	10	ERSD	D	N	57193783	4928543		4
LE	1	ERS	D	N	56317493	4723376		60
LE	2	ERS	D	N	56122884	4683761		240
LE	3	ERS	D	Y	56359403	4767445		439
LE	4	ERS	D	N	56376572	4737421		5820
LE	5	SC	D	N	56453439	4781983		161
LE	6	SEDL	D	N		4795002	56629629	3330
LE	7	SEDL	D	N		4808552	56737165	630
LE	8	SEDL	I	N		4804616	56769830	6300
LE	9	ERS	D	N	56521447	4771873		18824
LE	10	SPRE	D	N	56776862	4830699		345
SA	1	SRAD	D	N		4628522		299
SA	2	SRAD	D	Y		4685806		415
SA	3	SRAD	D	N		4569856		104
SA	4	SA	D	N		4623490		182
SA	5	SA	D	N		4595738		59
SA	6	SA	D	N		4598254		74
SA	7	SA	D	Y		4685212		65
SA	8	SA	D	N		4595744		1514
SA	9	SRAD	D	N		4623495		539
SA	10	SA	D	Y		4641694		287
SR	1	ST	D	N		4642138	12474183	500
SR	2	ST	D	N		4473349	12474268	1845
SR	3	SPDL	D	N		4642122	12474300	7910
SR	4	SPDL	D	N		4563550	56548608	540
SR	5	SPDL	D	Y		4531532	56549649	540
SR	6	SPDL	D	Y		4637868	12474313	7550
SR	7	SPDL	D	N		4473337	12474198	60
SR	8	ST	D	N		4315163	56562937	905
SR	9	SPDL	D	Y		4429221	12490569	870
SR	10	SDNL	D	N		4504016		29

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX B

LONDON NETWORK RESULTS

AND

SAMPLE LISTS

REPEX DATA

LONDON NETWORK – REPEX DATA SAMPLE LIST

LDZ	OBJECT ID	MATERIAL	DIAMETER	LENGTH LAID	CURRENT STATUS	STATUS DATE	JOB NUMBER	JOB TYPE
NL	510783386	CI	18in	1533	DP	30-Mar-2004	NL 3142769	MARC
NL	510858445	CI	8in	1148	DI	30-May-2003	NL 3518959	MARP
NL	510850476	CI	12in	822	DI	13-Jun-2003	NL 2745935	MARP
NL	511014292	CI	4in	790	DI	29-Aug-2003	NL 4141823	MARP
NL	510795932	CI	8in	760	DI	14-Nov-2003	NL 4205682	MARP
NL	510917301	DI	6in	710	DP	7-Aug-2003	NL 3653161	MARP
NL	510938037	DI	10in	640	DI	25-Apr-2003	NL 3657983	MARP
NL	511014323	CI	4in	613	DI	27-Jan-2004	NL 4444762	MARP
NL	510949234	CI	6in	583	DI	13-Jun-2003	NL 3606777	MARP
NL	510852808	SI	4in	510	DI	3-Feb-2004	NL 4191861	MARP
NL	510997685	DI	200mm	494	DP	10-Mar-2004	NL 3689329	MARP
NL	510859205	CI	6in	457	DI	19-Mar-2004	NL 4314180	MARP
NL	510928794	SI	15in	449	DI	22-Aug-2003	NL 3479124	MARP
NL	511008056	CI	4in	435	DI	27-Jan-2004	NL 4483922	MARP
NL	510826474	DI	100mm	419	DI	28-Apr-2003	NL 3556371	MARP
NL	510846991	DI	150mm	172	DP	26-Sep-2003	NL 4423360	MARP
NL	510880758	SI	4in	179	DI	26-Mar-2004	NL 4357343	MARP
NL	510794690	SI	4in	177	DP	28-Jul-2003	NL 3941846	MARP
NL	510875460	CI	4in	175	DI	19-Nov-2003	NL 4434811	MARP
NL	510897361	CI	8in	175	DI	21-Jul-2003	NL 4097241	MARP

LONDON NETWORK REPEX REPORTING RESULTS

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				Centre	Local						
Myrtle Crecent Slough		510880758	4357343	179	161	4	CI	623394979	4357280	115	90
		510880759	4357343	116	115	4	CI	623395229	4357280	161	90
Services transferred	7	625274695	4357343	12	12	4	CI	625274694	4357280	12	90
Domestic service relays	24	510880760	4357343	59	54	4	CI	625274693	4357280	54	63
Non dom service relays		510880761	4357343	43	54	2	ST	625274696	4357280	54	63
		625277690	5014594	3	3	4	CI	625274691	5014535	8	125
			Total	**412**	**399**			625274688	5014535	3	90
			Error	**3.26%**					**Total**	**407**	
Wightman Road Hornsea		510938037	3657983	640	640	10	DI	610310185	2870012	655	180
		510963197	3657983	16	16	6	SI	610440227	2870012	10	125
Services transferred	177	510938036	3657983	10	10	6	DI	610440317	2870012	11	125
Domestic service relays	23	510938035	3657983	10	10	6	SI	610440318	2870012	11	125
Non dom service relays		510938034	3959239	12	12	10	DI	622624068	3856258	7	180
Note: 622624068 abandoned as part of final connections		622750315	4006563	28	28	90	PE	622624069	3856267	9	90
		606663550	4488307	4	4	4	CI	622624070	3856267	39	90
		510927590	3658062	14	14	12	CI	622981742	3911147	38	90
		622860921	3658062	95	95	10	CI	622860920	3957241	419	180
		510938052	3658062	419	419	10	CI	624115306	3957241	2	180
		510920164	3658112	11	11	15	CI	624115307	3957241	1	180
		611290587	4488294	4	4	10	CI	624115308	3957241	2	180
		611291203	4488294	3	3	10	CI	624115309	3957241	3	180
		622624068	4488294	7	7	180	PE	624115310	3957241	2	180
			Total	**1273**	**1273**			624115311	3957241	2	180
			Error	**0.00%**				624115312	3957241	4	180
								624115313	3957241	3	180
								624115314	3957241	2	180
								610310186	2871199	131	250
								610440316	2871199	12	180
								610310188	2871483	11	250
								624115305	2871483	4	90
									Total	**1378**	
Southend Artial Road		510783386	3142769	1533	1533	18	CI	619670853	3142442	1531	400
		601361899	3142769	15	15	315	PE	619670855	3142442	4	315
		510783315	3142817	28	28	18	CI	619670854	3142544	825	400
		510783311	3142817	792	792	18	CI		**Total**	**2360**	
			Total	**2368**	**2368**						
			Error	**0.00%**							

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				Centre	Local						
Upper Tollington Park Finsbury Park		510928794	3479124	449	449	15	SI	605601165	1774107	**450**	355
			Total	**449**	**449**						
			Error	**0.00%**							
Edwards Avenue Ruislip		510949234	3606777	583	583	6	CI	621411877	3606752	583	125
		623219137	4115014	2	2	4	DI	621420498	4115008	2	125
Services transferred	142	623219138	4115014	2	2	4	DI	621420499	4115008	2	125
Domestic service relays	107	623219139	4115014	7.5	7.5	4	DI	621420500	4115008	9	125
Non dom service relays		510949235	4115014	20	20	6	CI	621420497	4116012	4	125
		612834959	4115014	3	3	6	CI	621411880	3606787	49	63
		623219140	4116032	4	4	4	CI	621411875	3606110	288	75
		510951360	3606797	51	51	4	CI	621411876	3606798	234	75
		510949010	3606744	285	288	4	CI	622585426	3606798	28	75
		510951527	3606830	290	290	4	CI	622585428	3606798	23	75
		622585425	3606830	28	28	4	CI	622585430	3606798	8	75
		622585427	3606830	23	23	4	CI	621410922	3606841	360	180
		622585429	3606830	8	8	4	CI	621420165	3606841	6	125
		510916373	3606851	320	322	8	CI	623859152	3606841	10	180
		623859153	3606851	10	10	8	CI	621411873	3606841	11	180
		510916374	3606851	55	55	8	CI	621420161	3606841	2.5	180
		510916395	3606851	11	11	8	CI	621420162	3606841	2.5	125
		623859155	3606851	2.5	2.5	4	CI	623859154	3606875	4	180
		623859157	3606851	6	6	4	CI	621410921	3606875	41	90
		510953692	3606891	4	4	8	CI		**Total**	**1667**	
		510953691	3606891	41	41	6	CI				
			Total	**1756**	**1761**						
			Error	**-0.28%**							
Stoke Newington Church Street		510917301	3653161	710	726	6	DI	604400595	3653389	716	180
		623933887	3653161	4	4	90	PE	623933892	3653389	3	180
Services transferred	29	623933888	3653161	4	4	90	PE	623933893	3653389	4	90
Domestic service relays	4	623933889	3653161	2	2	63	PE	623933894	3653389	4	90
Non dom service relays	11	623933890	3653161	2	2	63	PE	623933895	3653389	2	63
		616123733	3653161	3	3	4	CI	623933896	3653389	2	63
			Total	**725**	**741**				**Total**	**731**	
			Error	**-2.16%**							

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				Centre	Local						
Brentford Road Romford		510795932	4209558	760	760	8	CI	622068988	4163035	760	180
		510959484	4209558	257	257	8	CI	622069840	4163035	3	125
Services transferred	91	624468528	4209558	406	406	4	CI	624478212	4163035	2	180
Domestic service relays	140	607050715	4209558	16	16	4	CI	624478213	4163035	13	125
Non dom service relays		607862412	4209558	5	5	4	CI	624478214	4163035	2.5	180
		510864382	4209558	7	7	4	CI	624478210	4163035	2	63
		510804229	4209558	5	5	4	CI	622068993	4163035	2	63
		510963401	4209558	9	9	4	CI	622068994	4163035	3	180
		510816313	4209558	12	12	4	CI	622069835	4163035	1	63
		621581733	4209558	3	3	4	CI	622069836	4163035	5	63
			Total	**1480**	**1480**			622069837	4163035	6	125
			Error	**0.00%**				622069838	4163035	3	125
								622079757	4163035	7	125
								622068987	4207921	257	180
								622069841	4207921	3	180
								623357587	4208597	406	180
								622069842	4208268	2	63
								622070466	4208268	5	125
									Total	**1477.5**	

High Street Brentford		510850476	2745935	822	822	12	CI	622516731	2745770	822	180
		623294364	2745935	50	51	12	CI	623294362	2745770	4	90
Services transferred	13	623294365	2745935	34	34	12	CI	623294361	2745770	4	125
Domestic service relays	4	612850173	2745935	4	4	12	CI	623294363	2745770	8	180
Non dom service relays		612851325	2745935	10	10	12	CI	623294356	2745770	10	180
		623294856	4153650	13	13	4	CI	623294357	2745770	4	90
		623294858	415879	4	4	4	CI	622516733	2745770	3	125
		623294358	2745641	3	3	4	CI	623294360	2745770	1	125
		623294359	2745641	1	1	4	CI	610501381	2745684	35	355
		510850495	2745641	9	9	6	CI	623294857	4153569	14	125
		612837624	2745641	43	43	4	CI	623294859	4153756	4	125
			Total	**993**	**994**				**Total**	**909**	
			Error	**-0.10%**							

Mayflower Road Billericay		510875460	4434811	175	175	4	CI	622656933	4434759	175	90
		510855655	4591362	63	63	4	CI	622656935	4591145	63	90
Services transferred	4	510892860	4432724	42	43	4	CI	622656934	4420578	43	90
Domestic service relays	26		**Total**	**280**	**281**				**Total**	**281**	
Non dom service relays			**Error**	**-0.36%**							

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				Centre	Local						
Northaw Road West Northaw		511014292	4141823	790	790	4	CI	622574733	4141759	790	90
		511014272	4142548	160	160	12	CI	622574734	4141759	3	63
Services transferred	37	511014295	4142009	25	25	12	CI	622574735	4141759	3	90
Domestic service relays	38	511014274	4142762	115	112	4	CI	622574736	4141759	3	63
Non dom service relays		511014275	4142762	42	42	4	SI	622574737	4141759	3	90
Note: Project still not complete although		511014299	4142698	186	182	4	CI	622575371	4142497	160	250
all WRs have been returned as complete.		511014303	4436092	142	142	4	CI	622574739	4141977	25	250
511014 295 was reconnectd due to			**Total**	**1460**	**1453**			622574731	4142744	112	90
pressure problems and 622574739 was			**Error**	**0.48%**				622574732	4142744	42	90
never laid								622574730	4142632	182	90
								623994170	4436052	142	90
									Total	**1465**	
Hithermoor Road Stanwell		510852808	4191861	510	510	4	SI	621997710	4191844	9	90
		510852815	4191861	8	9	4	SI	621997274	4191844	444	90
Services transferred	21	606702612	4191861	8	8	4	SI	621997706	4191844	34	90
Domestic service relays	47	510852811	4191861	57	56	4	SI	621997275	4191844	74	90
Non dom service relays		510852812	4191861	26	26	6	SI	621997708	4191844	17	125
		624889932	4191861	34	34	4	SI	621997709	4191844	25	125
		624889933	4191861	74	74	4	SI		**Total**	**603**	
		624889934	4191861	17	17	6	ST				
		624889935	4191861	25	25	6	SI				
		510945181	4191861	14	14	6	DI				
			Total	**773**	**773**						
			Error	**0.00%**							
Fennells Way Flackwell Heath		510997685	3689329	494	494	200	DI				
			Total	**494**	**494**						
TOTALS			**Error**	**0.00%**							

Services Transferred	Domestic Services	Non dom Services	Mains Abandoned		Error	Mains Relaid
			Centre	Local		
500	390	11	12463	12466	-0.02%	11728.5

Mains units chosen as sample from spreadsheet issued by Transco Centre

Centre **Mains unit lengths in spreadsheet issued by Transco Centre**

Local **Mains unit lengths recorded in Network**

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX C

SCOTLAND NETWORK

SAMPLE LISTS

CUSTOMER INTERRUPTIONS

RIGs Review Sample CIs Scotland Period 5

Interruption Category	Number	Job Type	Consumer Type	Priority	Originating EMW Reference	STORMS reference	PUR Reference	Reported Duration
3P	1	ERSD	D	N	55130395	4478408		30
3P	2	SEDL	D	N		4569673		1370
3P	3	ERSD	D	N	55037680	4459400		90
3P	4	ERSD	D	N	55561673	4564471		25
3P	5	SEDL	D	N		4584163		1740
3P	6	ERSD	D	N	55435144	4538861		145
3P	7	ERSD	D	N	55287556	4511682		15
LE	1	SEDL	D	N		4596041		315
LE	2	SEDL	D	N		4596049		315
LE	3	ERS	D	N	55377672	4527083		60
LE	4	SEDL	D	N		4470888		60
LE	5	ERS	D	N	55172181	4486828		115
LE	6	SEDL	D	N		4627645		46155
LE	7	ERS	D	N	55840077	4627063		15
SA	1	SA	D	N		4489531		45
SA	2	SODL	D	N		4536300		90
SA	3	SRAD	D	Y		4585096		30
SA	4	SRAD	D	N		4439560		149
SA	5	SODL	D	N		4526523		9752
SA	6	SA	D	N		4481885		510
SA	7	SA	D	N		4447413		15
SR	1	ST	D	N		4664488	12779469	98100
SR	2	SRB	D	N		4141592		540
SR	3	ST	D	N		4475429		495
SR	4	ST	D	N		4514808		40230
SR	5	SPDL	D	N		4573413		31667
SR	6	SPDL	D	N		4573457		31645
SR	7	SPDL	D	N		4777762	10718269	90
SR	8	SPDL	D	N		4663460		30
SR	9	SEDL	D	Y		4628778	55914158	407
SR	10	SPDL	D	N		4777991	10718256	120

RIGs Review Sample CIs Scotland Period 6

Interruption Category	Number	Job Type	Consumer Type	Priority	Originating EMW Reference	STORMS Reference	PUR Reference	Reported Duration
3P	1	ERSD	D	N	56388321	4741763		1030
3P	2	ERSD	D	N	56419175	4747384		75
3P	3	ERSD	D	N	56428823	4750611		420
3P	4	ERSD	D	N	57405718	4980079		165
3P	5	ERSD	D	N	57506188	5006619		22
3P	6	ERSD	D	N		4915541	57150466	299
3P	7	ERSD	D	N	56687294	4810436		300
LE	1	SEDL	D	N		4953631		255
LE	2	ERS	D	N	57422322	4984727		8580
LE	3	ERS	D	N	57516606	5009861		73
LE	4	ERS	D	N	57434169	4987046		61
LE	5	ERS	D	N	57446981	4990109		30
LE	6	ERS	D	N		4934352	57362671	237
LE	7	ERS	D	N	57193646	4929509	57704409	53254
MF	1	ERM10	D	N	57221056	4935824		195
MF	2	ERM5	D	N	56476227	4763108		26
MF	3	ERM5	D	N		4968008	57364349	170
MF	4	ERM5	D	N		4968008	57364334	168
MF	5	ERM5	D	N		4968008	57364312	167
MF	6	ERM5	D	N	57281099	4950476		60
NM	1	SC	D	N	56318001	4723783		30
SA	1	SODL	D	N		5006229		240
SA	2	SA	D	N		5004547		131265
SA	3	SRAD	D	N		4927486		180
SA	4	SA	D	N		5014697		30
SA	5	SRAD	D	N		4941836		495
SA	6	SRAD	D	N		4730149		35
SA	7	SRAD	D	Y		4994264		210
SR	1	ST	D	Y		4734650	57417824	361
SR	2	ST	D	N		5061324		240
SR	3	SPDL	D	N		4975307		1365
SR	4	SPDL	D	N		4929054		24
SR	5	SPDL	D	N		4695359		240
SR	6	SPDL	D	N		4715648	57758162	89596
SR	7	SPDL	D	N		4820509	10719863	30
SR	8	SEDL	D	N		4764505	56527425	53
SR	9	SPDL	D	Y		5064486	10719856	180

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

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APPENDIX D

SCOTLAND NETWORK RESULTS

AND

SAMPLE LISTS

REPEX DATA

SCOTLAND NETWORK – REPEX DATA SAMPLE LIST

LDZ	OBJECT ID	MATERIAL	DIAMETER	LENGTH LAID	CURRENT STATUS	STATUS DATE	JOB NUMBER	JOB TYPE
SC	466254027	CI	15in	560	DP	17-Apr-2003	SC 3919302	MARP
SC	467226159	SI	8in	577	DP	27-Aug-2003	SC 4412842	MARC
SC	465834996	DI	8in	345.5	DP	29-Aug-2003	SC 4642047	MARP
SC	466789734	CI	3in	318	DP	23-Feb-2004	SC 4952235	MARP
SC	466035558	SI	12in	301	DP	7-Feb-2004	SC 4908060	MARP
SC	466697123	CI	4in	296	DP	30-Apr-2003	SC 4062955	MARP
SC	467222138	DI	300mm	292	DP	10-Sep-2003	SC 4409299	MARC
SC	467235777	DI	8in	290	DP	11-Mar-2004	SC 4825684	MARC
SC	466859086	SI	4in	280	DI	16-Jul-2003	SC 4305587	MARP
SC	467226196	SI	8in	274	DP	27-Aug-2003	SC 4412867	MARC
SC	624648207	CI	18in	257	DI	8-Sep-2003	SC 4623987	MARP
SC	465866058	SI	4in	254	DP	25-Jun-2003	SC 4180906	MARP
SC	467230513	CI	3in	236	DP	24-Mar-2004	SC 4677528	MARP
SC	623810069	CI	2in	230	DP	8-Aug-2003	SC 4361643	MARP
SC	466502446	CI	6in	229	DP	18-Nov-2003	SC 4607567	MARP
SC	467015383	SI	3in	227	DP	20-Jun-2003	SC 4208361	MARP
SC	465887599	CI	4in	202	DI	12-May-2003	SC 4056353	MARP
SC	466941407	SI	6in	197	DP	4-Jul-2003	SC 4249382	MARP
SC	465935923	SI	4in	194	DI	29-Jun-2003	SC 4205197	MARP
SC	466774064	SI	10in	188	DP	19-Nov-2003	SC 4655339	MARP

SCOTLAND REPEX REPORTING RESULTS

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				CENTRE	LOCAL						
Kilmarnock Road Glasgow		624648207	4623987	257	257	18	CI	624393576	4625197	1	180
		624647114	4623987	14	14	18	CI	624393577	4625203	8.3	250
Sevice transfers		624648205	4623987	194	194	18	CI	624639912	4748074	6	400
Dom service relays		624648206	4623987	52	52	18	CI	624640639	4748117	38	400
Non dom service relays		624648208	4623987	35	35	18	CI	624640640	4748119	8.2	400
		624648209	4623987	8	8	18	CI	624640641	4748120	86.4	400
		606279226	4623987	10.5	10.5	18	CI	624640642	4748121	6.3	400
		624647109	4624051	6	6	18	CI	624640643	4748123	111	400
		624647110	4624051	38	38	18	CI	624640644	4748603	0.4	18
		624647112	4624024	15	15	18	CI		**Total**	**265.6**	
		624647113	4624024	91	91	18	CI				
		465160674	4624085	12	12	12	CI				
		467229998	4624118	22	22	8	CI				
		465160671	4624145	8	8	8	CI				
			Total	**762.5**	**762.5**						
			Error	**0.00%**							
Muirwood Road Currie		466502446	4607567	230	230	6	CI	623906016	4399347	355	180
		466503893	4607709	71	72	4	CI	623906017	4399369	2	180
Sevice transfers	6	624357391	4607802	1.5	1.5	4	CI		**Total**	**357**	
Dom service relays	44	466502443	4607865	77	78	6	CI				
Non dom service relays		466502443	4607593	41	38	6	CI				
		466502439	4607911	37	39	4	CI				
		466502434	4608004	3	3	4	CI				
		466502451	4603425	107	107	6	CI				
		624217972	4607478	1.5	1.5	4	CI				
		466502602	4603441	61	57	6	CI				
			Total	**630**	**627**						
			Error	**0.48%**							
Dunvegan Avenue Coatbridge		465887599	4056353	116	202	4	CI	623095676	4056130	70	90
		465895423	4056298	90	85	4	CI	623095677	4056153	71	63
Sevice transfers		465879728	4056269	67	71	3	CI	623095679	4056172	204	90
Dom service relays	69	465895422	4056237	72	71	3	CI	623095679	4056195	72	63
Non dom service relays		465900300	4056396	72	72	4	CI	623095680	4056218	71	90
		465887603	4056444	65	72	4	CI		**Total**	**488**	
			Total	**482**	**573**						
			Error	**-15.88%**							

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				CENTRE	LOCAL						
Appin Crescent Dunfermline		466774064	4655339	188	182	10	CI	623674073	4320262	5	250
		466774059	4655331	108	110	10	CI	623674074	4320294	14	315
Sevice transfers	1	623800610	4655332	30	30	10	CI	623799355	4357657	85	315
Dom service relays	1	466774038	4653930	274	275	6	CI	623799356	4357914	325	315
Non dom service relays		624395095	4655384	3	3	2	CI	623800607	4358045	70	315
WRs for service work for nos 60 - 110 not on the		610054621	4655530	3	4	10	CI	623800608	4358079	8	315
STORMS system for any phase of the project.		601257637	4655299	8	8	63	PE	624228530	4540545	45	63
		446774069	4653929	65	60	6	CI	624228531	4540551	39	63
		446774073	4653927	6	8	6	CI	624228532	4540586	17	63
		446774081	4653928	4	6	6	CI	624063759	4471291	38	63
		446774072	4653882	10	10	5	CI	624403598	4618855	25	63
			Total	**699**	**696**				**Total**	**671**	
			Error	**0.43%**							

Station Road Caldercruix		465935923	4205298	194	194	4	CI	623427462	4204978	195.5	90
		465033898	4205003	162	145	4	CI	623427463	4205003	72	63
Sevice transfers		465924549	4205268	71	72	4	CI	623427464	4205045	8.5	63
Dom service relays	75	465924551	4205339	6	6	63	PE	623427465	4205083	149.5	90
Non dom service relays			**Total**	**433**	**417**			623427466	4205112	5.5	180
			Error	**3.84%**					**Total**	**431**	

Angus Road Scone		466941407	4249382	195	220	6	SI	623543720	4249281	186	180
		466941404	4249415	21	21	6	SI	623543725	4250253	158.5	90
Sevice transfers	55	466941419	4249479	13	13	6	SI	623550705	4249913	23	180
Dom service relays	42	466941405	4249587	375	375	2	ST	623550706	4250383	162	90
Non dom service relays		623550708	4249684	9	9	3	SI	623550707	4250394	116	63
		466941917	4249492	9	21	3	SI	623550710	4249862	16	90
		466941410	4249577	106	92	3	SI	623550709	4249896	101	63
		466953470	4250417	70	66	2	ST	623550721	4249393	21	180
		466953463	4250415	115	116	3	SI	623550722	4249330	16	180
		446953459	4250406	166	162	3	SI	623550704	4249963	86	180
		466957586	4250423	35	34	3	SI		**Total**	**885.5**	
		466951442	4250109	21	21	180	PE				
		466951419	4250208	100	100	6	CI				
		466951474	4250347	118	118	3	CI				
		466951483	4260053	40	40	90	PE				
			Total	**1393**	**1408**						
			Error	**-1.07%**							

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				CENTRE	LOCAL						
New Street Musselborough		466254027	3919302	540	540	15	CI	622476111	37292867	45	355
		466251029	3919045	70	70	15	CI	622476113	3792893	12	315
Sevice transfers		466254029	3919165	460	460	15	CI	622476114	3792902	10	315
Dom service relays		466249743	3919265	30	30	15	CI	622476115	3792927	529	315
Non dom service relays		467229868	3919553	47	47	15	CI	622476116	3792932	7	250
			Total	**1147**	**1147**			622840231	3948788	538	250
			Error	**0.00%**					**Total**	**1141**	
The Hallows Kirkaldy		466859086	4305587	285	285	4	SI	623666857	4305536	285	90
		466859081	4305599	57	59	6	SI	623666858	4305547	59	90
Sevice transfers	80		**Total**	**342**	**344**				**Total**	**344**	
Dom service relays			**Error**	**-0.58%**							
Non dom service relays											
Newcastle Road Jedburgh		467230513	4677528	236	240	3	CI	624506268	4677341	2	90
		466603451	4677517	23	23	6	CI	624506269	4677433	262	90
Sevice transfers	2	467230516	4677535	9	9	63	PE	624506270	4677443	3	63
Dom service relays	1	467230511	4677552	7	7	63	PE	625064317	4929971	12	63
Non dom service relays			**Total**	**275**	**279**				**Total**	**279**	
			Error	**-1.43%**							
Auchinraith Avenue Hamilton		466035558	4908060	304	304	12	CI	622675754	4306725	193.5	315
		466035545	4908103	5	5	12	CI	622675755	4306775	4	63
Sevice transfers			**Total**	**309**	**309**			622675756	4306868	8	180
Dom service relays			**Error**	**0.00%**				622675757	4306930	11	180
Non dom service relays								622675758	4307037	1.5	180
								622675759	4307092	2	315
									Total	**220**	
Eldrick Avenue Bathgate		623810069	4361643	230	230	2	CI	623685659	4310382	172	180
		466529264	4361433	128	128	4	CI	623685660	4310399	1.7	180
Sevice transfers	28	623657112	4361725	20	20	8	CI		**Total**	**173.7**	
Dom service relays	1	623810070	4361705	100	100	2	CI				
Non dom service relays			**Total**	**478**	**478**						
			Error	**0.00%**							
Main Road Condonnnal		467222138	4409299	292	284	300	DI	623744057	4335114	314.5	315
			Total	**292**	**284**				**Total**	**314.5**	
Sevice transfers			**Error**	**2.82%**							
Dom service relays											

ADDRESS		DECOMMISSIONED MAINS ID	STORMS WR NUMBER	LENGTH		SIZE	MAT	RELAY MAINS ID	STORMS WR NUMBER	LENGTH	SIZE
				CENTRE	LOCAL						
Woodhead Street Dunfermline		466789734	4952235	318	318	3	CI	624497798	4178391	159	90
		609719963	4911568	3	3	63	PE	624996472	4911473	19	63
Sevice transfers	27	607623727	4911590	23	23	63	PE		**Total**	**178**	
Dom service relays	15	466789757	4952149	20	20	3	CI				
Non dom service relays		624468747	4657617	151	151	6	SI				
		624470453	4657656	140	140	4	SI				
		607623729	4678623	3	3	3	ST				
		466777903	4679073	61	60	3	ST				
		466789752	4678620	45	32	3	SI				
		466789748	4678613	57	58	3	ST				
		466794932	4678610	30	30	3	SI				
		466794927	4678608	49	50	3	SI				
		606168911	4679112	60	60	63	PE				
		606168909	4678606	28	28	3	ST				
		624994410	4911599	15	19	3	CI				
		607623727	4911590	23	23	63	PE				
		609719963	4911568	3	3	63	PE				
		466794921	4678580	84	84	3	ST				
			Total	**1113**	**1105**						
			Error	**0.72%**							

TOTALS

Services Transferred	Domestic Services Relaid	Non domestic Services Relaid	Mains Abandoned		Error	Mains Relaid
			Centre	Local		
346	**355**	**0**	**11345**	**11417.5**	**-0.63%**	**8052.6**

Mains units chosen as sample from spreadsheet issued by Transco Centre

Centre **Mains unit lengths in spreadsheet issued by Transco Centre**

Local **Mains unit lengths recorded in Network**

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX E

OFGEM SCOPE OF WORK

AND

TERMS OF REFERENCE

Annex A

TERMS OF REFERENCE FOR ASSESSING TRANSCO'S MEASUREMENT SYSTEMS AND RIGS REPORTING

BACKGROUND

The Office of Gas and Electricity Markets (Ofgem)

Ofgem is the regulator for the gas and electricity industries in England, Scotland and Wales. It's principal objective is to protect the interests of gas and electricity consumers, both present and future, by promoting effective competition where possible. In performing that duty, it has regard to (among others) the interests of individuals who are disabled or chronically sick, individuals of a pensionable age or on low incomes, individuals residing in rural areas and to the environment.

Transco interruptions incentive scheme

As part of the last Transco price control review, which came into effect in April 2002, it was recognised that further work needed to be carried out to address some of the weaknesses which had been associated with the existing framework of price regulation. This included a commitment to developing an incentive scheme linking certain output measures to financial incentives under the price control mechanism – covering the number and duration of non-contractual supply interruptions. Ofgem intends to introduce this incentive scheme on 1 April 2005 so that it has effect for the remainder of the current price control period.

The robustness of a quality of service incentive scheme on Transco depends on the consistency and accuracy of the information it is reporting. As such, and in parallel with the development of the price control framework, Ofgem developed detailed definitions and related instructions and guidance for the measurement of the number and duration of interruptions and other output measures. These were published in the Regulatory Instructions and Guidance (RIGs) in February 2002. This document is currently being updated with a revised version due to be published in February 2004.

The scope of the information that Transco is required to provide under the outputs reporting framework includes the following:

- the number and duration of non-contractual supply interruptions per year;
- information on network mains and service replacement;
- information on the resolution of shipper queries;and
- information on environmental measures

The RIGs and other relevant documents including the draft and final proposals for Transco's price control, published in June and September 2001 respectively, are available on Ofgem's website www.ofgem.gov.uk

THE PROJECT

Before introducing the incentive scheme, Ofgem requires a technical consultant ("the consultant") to review Transco's current measurement systems for reporting the number and duration of interruptions, assess the potential accuracy of Transco's interruptions' measurement systems, assess Transco's compliance with the RIGs reporting requirements in respect of interruptions and develop an audit framework for assessing the accuracy of reported interruption data in future years.

As part of the work on assessing the potential accuracy of measurement systems, the consultant will be required to make recommendations to Transco on how to improve the robustness of their systems, taking into account the costs and benefits of these recommendations and any information provided by Transco on the potential impacts they might have on safety. These accuracy estimates will need to be robust and fully explained as they may impact on any accuracy target Ofgem sets for Transco to report this information post April 2005.

Transco has already provided Ofgem with three quarters of interruptions data (i.e. in respect of the number and duration of interruptions) for 2003/04. Information on the final quarter of 2003/04 should be provided by the end of April. The consultant will need to assess whether this information has been collated in accordance with the RIGs, in particular whether Transco has consistently applied the definitions, instructions and guidance

contained therein. The consultant will also need to identify any areas where Transco has not followed the RIGs and provide an estimate on the potential inaccuracies this might impart on the reported information.

Transco has indicated to Ofgem that it has concerns over the quality of data it has gathered using the RIGs definitions. As such, the consultant will also be required to assess the programme of improvements Transco has initiated to improve data quality.

Ofgem intends to carry out annual audits of Transco's measurement systems for interruptions and reported data. A key objective of this work will be to develop an appropriate audit framework including a methodology for assessing the accuracy of data on a statistical basis in future years.

Programme of work – initial review

The consultant will be required to undertake three distinct, but related, pieces of work as part of the initial review:

- assess the potential accuracy of Transco's measurement systems;
- assess Transco's RIGs compliance; and
- assess the programme of work Transco has introduced to improve data quality

Assessing measurement systems

The first stage of work will be understand, review and assess the potential accuracy of Transco's measurement systems. It is important that the measurement systems are robust in design and application as Transco will use the outputs from it's measurement systems to calculate the number and duration of interruptions to supply.

Ofgem considers that the assessment of measurement systems will have a number of elements and will be a mix of process and numerical audits. These will be combined in coming to an overall assessment of the potential accuracy of the systems. In undertaking this work, the consultant will need obtain a clear understanding of the systems Transco uses to report interruptions, including how they should capture interruptions data as well carrying out robust tests of the systems to assess whether the 'theoretical' understanding is mirrored in the output from the systems. Ofgem anticipates that the consultant will need to develop detailed questionnaires to understand Transco's measurement systems and use appropriate tools to test their accuracy.

Ofgem does not expect the auditors to base their opinions on information to which Transco could not reasonably gain access although Transco should provide necessary historic records (for example with respect to connected customers).

Assessing RIGs compliance

There are a number of areas where it may be possible for inaccuracies to arise in the reporting of the interruptions information required under the RIGs, including:

- having in place measurement systems that are based on inaccurate information;
- having in place processes that are not robust or sound or consistently applied;
- not keeping measurement systems up to date for changes in the number of connected customers;
- not applying the detailed definitions and guidance as outlined in the RIGs; or
- data entry and or transcription errors

The second stage of work will be for the consultant to assess whether the information on the number and duration of interruptions provided thus far during 2003/04 has been collected in accordance with the RIGs requirements, and to estimate the scale of any inaccuracies. The consultant will be required to indicate to Ofgem where this is not the case because reporting correctly under the RIGs is a licence requirement under Transco's Gas Transporter licence.

Assessing data quality

The third stage of work will require the consultant to review Transco's progress toward improving data quality, including assessing whether the programmes of improvement are filtering through to reported information. Transco has indicated that it has concerns over the quality of interruptions data provided for the first three

quarters of 2003/04. For example, it has suggested that during quarter 1, less than half of the actual interruptions experienced on its networks were reported. Transco is addressing this through a number of initiatives, including revising its training material for engineering teams, providing new guidelines to network office staff and having an escalation process to senior management.

Additional tasks – audit framework and repex data

The consultant will also need to undertake two other pieces of work. Following the review, it will be necessary for the consultant to develop a robust framework for undertaking formal audits in future years. The consultant will also be required to audit reported data on Transco's replacement programme ("repex programme") against Health and Safety Executive ("HSE") targets.

Audit framework

Ofgem intends to carry out formal annual audits of Transco's measurement systems and reported data for the number and duration of interruptions from 2005/06 until the end of the current price control period. As such, a key objective for this work will be for the consultant to develop a robust audit framework for use in future years. This will include both developing a method for assessing the accuracy of measurement systems and calculating the accuracy of reported numbers on a statistical basis.

Assessing the repex programme

Replacement expenditure during the current price control is projected to increase significantly compared to previous years. This is a result of a decision by the HSE to require Transco to replace all cast and ductile iron mains within 30 metres of premises over a 30 year period.

Under the RIGs, Transco is required to report its progress against the mains replacement programme. The consultant will need to audit reported performance against Transco's field records and report its findings to Ofgem.

Housekeeping

Transco currently reports interruptions information in standard MS Excel spreadsheets. The consultant will be required to provide an opinion as to whether this template is sufficient for purpose and also how it might be improved for future reporting.

It is expected that the audit will be open and that the consultant will establish a collaborative approach with Transco. As such, the consultant will need to develop a credible working relationship with Transco and to share ideas as to where improvements might be made going forward.

It is envisaged that the consultant will need to spend up to 2 weeks at Transco's head office in the Midlands to familiarise itself with it's reporting systems before undertaking the additional visits needed to complete the work. It is anticipated that the consultant will need to spend one week at Transco's head office and another one week each at two of Transco's regional networks to complete the assessment.

TIMETABLE, KEY DELIVERABLES AND REPORTING TO OFGEM

The consultant will be required to provide 5 hard copies of all draft and final reports, as well as electronic copies (in MS word) of each. The consultant will also be required to provide any data used in their work, including copies of spreadsheets, to Ofgem.

Specific timetables for each piece of work will be agreed with Ofgem in advance of the work being undertaken. However the following table sets out a high level indication of the timing of the key deliverables:

Key deliverable	**Indicative timing**
Ofgem appoints consultant	W/C 29 March 2004
Consultant familiarises themselves with Transco's systems	W/C 5 April

Consultant undertakes assessment of accuracy of systems and RIGs compliance	W/C 19 April
Consultant presents draft report to Ofgem	W/C 17 May
Transco comments on draft report	W/C 24 May
Consultant presents final report to Ofgem	W/C 7 June

The consultants will be required to attend initial set up meetings with both Ofgem and Transco. In addition they will be required to report on a regular basis to the Ofgem project team, including attending regular progress meetings. The consultant will also need to present its results to a wider audience, including Transco, once the final report has been presented to Ofgem.

SKILLS

The consultant must demonstrate sufficient technical understanding and expertise to undertake the areas of work identified above. Experience and knowledge of the gas distribution industry is a prerequisite as is a detailed understanding of the operation and management of incident response and fault reporting systems in the gas industry. IT experience including knowledge of relevant programming languages or systems is also essential. The ability to think laterally and to provide innovative ideas and solutions will also be an important attribute as will the ability to form a credible working relationship with Transco from the outset. Experience and knowledge of audit processes is also required.

NATURE AND WAYS OF WORKING

The contract will be awarded on a firm price basis. As such, the prospective consultants will be required to submit a firm price quote for the work and an estimate of the number of working days to complete the task. It may also be necessary for the consultant to provide ad hoc advice. Ofgem would expect this to be charged at an agreed day rate for the duration of the contract.

Ofgem anticipates that a similar, albeit more comprehensive audit, will be required on an annual basis for the remainder of the current price control.

The consultant is expected to have an appropriately qualified person to lead the project. The consultant will need to provide regular progress reports to Ofgem, both formal and informal, and obtain agreement from Ofgem for any work undertaken in addition to that detailed in these terms of reference. The consultant will be required to develop a workplan with Ofgem for the work identified, which will need to be discussed and agreed with Ofgem in advance.

The consultant will not be required to undertake the work from a base at Ofgem's office, although it will be necessary to attend regular meetings at Millbank.

CONFIDENTIALITY AND CONFLICT OF INTEREST

The contents of any work undertaken as part this contract should be treated as confidential. The consultant should not disclose information to parties other than Ofgem and NGT without Ofgem's prior written agreement.

In the context of this project, Ofgem is unlikely to consider work undertaken on behalf of a gas or electricity company in the UK as a conflict of interest per se. The consultants are asked to confirm in their response that there is no conflict of interest and to include a list of the work which has recently been or is presently being undertaken on behalf of gas and electricity companies.

For the duration of the contract Ofgem would not normally expect key individuals working on this project to also undertake work on behalf of Transco. If individuals selected for this project are to undertake such work the consultant should explain in their response how they intend to avoid any possible conflicts of interest.

Any reports produced by the consultant may, at Ofgem's instigation, be shown to Transco and where necessary written responses to their concerns may be required. In addition, Ofgem may make a final version of any report available to other interested parties, for example by placing reports on its website or in its library, or both.

RESPONDING TO THIS TERMS OF REFERENCE

Interested parties should set out in their response to these terms of reference:

- their method and approach to each of the areas of work identified. This should include a description of the work or tasks the consultants would undertake to complete the areas of work;
- what the consultants consider to be the main issues and how they will provide advice on these;
- the expertise and relevant experience of the staff that the consultants may engage to work on the various aspects of work identified;
- the staff resources required to complete the project;
- the cost per day for each of the staff;
- a firm price bid for the work (including VAT and expenses), as well an estimate of the number of working days needed to complete the work;

Interested parties should submit a response to these terms of reference by 12 noon on 22 March 2004, submitting one original and four hard copies of the tender document. Following consideration of the tenders, Ofgem may invite some or all of the consultants to discuss their proposals in greater detail. These meetings will take place at Ofgem's Millbank office. Ofgem will inform those selected for interview in due course. The successful consultant will be expected to begin work immediately after the appointment has been confirmed.

Ofgem is not responsible for any expenses incurred in the preparation of responses to these terms of reference or for those incurred if consultants are invited to discuss their proposals further. If you have any questions regarding this terms of reference please contact John Cole: **Email** john.cole@ofgem.gov.uk

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX F

CENTRE AND NETWORK

VISIT GUIDANCE NOTES

METHOD OF APPROACH

TRANSCO HQ SYSTEMS AND PROCESSES

Start of Visit W/C 19th April 2004

A period of 10 days has been allocated for this activity. Judgement will be made during the period as to whether the full 10 days needs to be spent working as a team together at Solihull. It may be appropriate for individual members of the team or the whole team to work on tasks from another base. Transco will be kept fully appraised of plans throughout the period.

At the end of this document a copy of the initial data/information list provided to OFGEM at the project Kick-Off meeting is included. This list is not considered to be exclusive as during the project further requirements will be identified and notified to Transco/OFGEM for action.

The purpose of this period is to ensure that the team is fully briefed on Transco Systems and Processes relevant to the project. As each of the team members has considerable experience and knowledge of Transco systems and working practices some areas will only require a brief update rather than a full detailed briefing. Due to this factor it is also considered that a number of additional activities may be undertaken during this time in preparation for the Visits to the Networks to compete assessment and review processes for both the RIGS compliance and REPEX data investigations.

The following sets out what is considered to be the general requirements for the visit. The review and assessment process will be iterative as it is not possible at this stage to list every requirement that the team may have during the 2-week period.

Transco will be providing facilities - room, PC etc booked for 2 weeks and parking at 31 Homer Rd, Solihull (Transco have stated that systems there may not be available in live environments).

Access will be required to all the systems involved in the processes, along with personnel expert in the operation and retrieval of data and reports. These will include:

- STORMS
- EMW
- QB5
- DATA WAREHOUSE
- SYSTEMS AND REPORTING TOOLS USED FOR EXTRACTING AND COLLATING RIGS DATA

Transco will provide inputs to Wilcock during that time, referring specifically to the systems discussed, other process steps and exceptions.

In order to identify further requirements during the initial 2-week process and possible requirements for the visits to the networks it is preferred to receive the inputs on all systems used in the relevant processes during the first 2 to 3 days of the visit.

For the last 2 hours of Monday the 19th the team will spend some time on an internal meeting to cover any issues relating to the collating, referencing of information and reports to agree a consistent approach.

The process maps will help give structure to data collection and flows - we need job creation through to data reporting to OFGEM. Transco have indicated that the process maps will be available. The existing process maps may require some additional steps introducing to present the complete picture. With focus on all data related matters, we would like to receive inputs on these processes and work through them with appropriate Transco personnel (who may be the HQ people already mentioned by Transco and / or others). Complementary work will be conducted in the chosen Networks.

Taking into account the above it would be helpful if Transco could provide a timetable taking into consideration the availability of staff that need to be involved in the process so that further feedback can be provided on facilities requirements or rescheduling of activities because of individuals not being available. We have already referred to the need for an iterative approach and both Transco and ourselves are at early stage 'What do you

want? What can you give? We need to communicate in order to bring it together.

A desktop review will be carried out with Transco, at Solihull, of the data related process issues, including consideration of the data already reported to OFGEM, and current action plans. It is this input and desktop review that will help to give focus on and help the efficiency of the subsequent stages of the review.

A particular grey area is accuracy - its assessment and calculation. Transco will have views and resources deployed on this. However, given current project timescales we need to consider this issue as early as possible. OFGEM have previously signalled the importance of this, although there was some recognition of the difficulty. It is likely to be a sensitive area and therefore one that would benefit from a full contribution from Transco who may already be using suitable techniques for other purposes.

REPEX Data

The area that has not been discussed to date is the review and audit of the REPEX data. It is suggested that during the time spent at Solihull one day is set aside for specific consideration of this area.

The output report on replacement activity for 2002-2003 has been reviewed. This report provided details on the lengths abandoned and replaced by size band, it did not provide details on the material replaced or pressure band, neither was there a comparison with the actual work planned for the period. We would like further details with regards to this area of work (as far as we are aware this information is generated as part of the Service Provider Agreement (SPA). This additional information would allow an assessment of actual replacement against target.

All replacement work is raised in STORMS and the work is recorded in STORMS as the work documents are closed. In the past details of lengths laid/abandoned, pressure band and diameters were retrieved through TEAR. Details are required for all the procedures and processes operated by Transco in order to complete replacement reporting.

The following pages in *Italics* is an outline of the deliverables for this project and this will provide a good guide to assist Transco in the identification and provision of data, information and personnel to assist with the review during the time spent in Solihull and subsequently in the Networks.

OUTLINE OF PROJECT DELIVERABLES (OFGEM ORIGINATED)

The consultant is required to:

- *Review Transco's measurement systems for reporting the number and duration of interruptions;*
- *Assess the potential accuracy of these measurement systems;*
- *Assess compliance with the RIGS in respect of interruptions;*
- *Assess the programme of work Transco has introduced to improve data quality;*
- *Develop an audit framework for assessing accuracy of reported interruptions information in future years; and*
- *Audit reported performance of REPEX programme*

Reviewing Transco's measurement systems:

The first stage of work will be to understand and review Transco's measurement systems for reporting the number and duration of interruptions. This may involve:

- *Obtaining a clear understanding of the systems Transco uses to record and report interruptions;*
- *Understanding how the systems interact (i.e. EMW and STORMS); and*
- *Examining the extent of manual intervention in the process of recording interruptions (i.e. the hand offs between teams) and how this may impact on the accuracy of reported information*

Wilcock will also need to provide an opinion and quantify the potential accuracy of these systems in recording interruptions information. This may take into account:

- *Estimated quantification of inaccuracies in measurement systems (for example, Wilcock may need to consider how accurate Transco's systems transfer data between systems); and*
- *The effect of Transco's training and internal auditing and how the RIGS have been interpreted*

RIGS compliance:

Wilcock will need to assess the extent to which Transco is recording and reporting information on interruptions in accordance with the definitions contained in the RIGS. This may involve detailed questionnaires of working practices, and testing of these practices with the processes followed by relevant Transco employees (or contractors) in Transco head office and in the Networks.

Where Transco is not following the RIGS, Wilcock will need to estimate the scale of any inaccuracies that this might have on reported interruptions data.

Data quality issues:

Transco has identified that the interruptions information it has reported for the first 3 quarters of 2003/04 only captures information on around half of the interruptions experienced. Wilcock will need to:

- *Understand reasons behind large number of errors[1] in data. (Transco estimates that it has only successfully reported around 50% of interruptions between April and December 2003);*
- *Review Transco action plans to improve data quality, including the revised training material for engineering teams, new guidelines to office staff and call centre re-briefing; and*
- *Review and comment on other data quality improvement initiatives Transco has introduced*

Developing the audit framework:

It is intended that formal audits of interruptions data will be undertaken in future years. As such, and as part of this project, Wilcock will need to develop an audit framework taking into account its findings from this interim review. Wilcock should:

- *Develop a method for assessing accuracy of Transco's measurement systems going forward; and*

[1] An error is where data is not consistent between STORMS and EMW, and or where business rules have not been followed to create an interruption. Data can only be reported once it is consistent across systems

- *Develop a method for calculating the accuracy of reported interruptions data on a statistical and robust basis*

Assessing the REPEX programme:

Under Section 5 of the RIGS, Transco is required to report performance against the HSE mains replacement programme. Wilcock will need to audit the reported information taking into account:

- *Field records for mains replacement; and*
- *Other sources of information*

Other tasks:

Wilcock should provide an opinion on the reporting arrangements developed to report RIGs specified information.

Wilcock should also provide any recommendations it has on Transco's working practices in this regard to both OFGEM and Transco

INITIAL DATA/INFORMATION LIST

1. List of key contact and details of people within OFGEM and Transco to include Transco National and Local contacts
2. Agreement on final deliverable and outcomes for the project
3. Current and historical information, agreements and discussions in the area between Transco and OFGEM
4. Copies of previously reported Transco data and any analysis that has been carried out
5. Copies of any written commentary provided by Transco on reported data
6. Any responses to Transco data sent by OFGEM back into Transco
7. Copies of any OFGEM published documents and reviews that are relevant to this project
8. Copies of any existing audit data and frameworks related to this project
9. Copies of established audit framework for Electricity
10. Copies of documents and screen prints relating to the recording, extraction and reporting of RIGs data.
11. Copies of the related process(es) i.e. recording of data through reporting to OFGEM.
12. Training - initial and follow up; records.
13. Quality control - local, central; records.
14. Governance - documented requirements; records.
15. Exploration of broad approach to audit e.g.

    Collaboration
    Departments/sections/key players/location
    Desktop analysis
    Office and site visits
    Delays

David Haddock
Project Manager
6th April 2004

NETWORK VISIT GUIDANCE NOTES

London Network (Slough):	**6th to the 11th of May 2004 (4 days)**
Scotland Network (Glasgow):	**17th to the 20th of May 2004 (4 days)**
Wilcock Consultants Representatives:	**David Haddock** **Kieran Jones** **Mike Chilton** **Peter Grimley**

Visit Objectives

Prior to the network visits 5 days have been spent with Transco in Solihull reviewing processes and systems involved in the compilation and reporting of RIGS data to OFGEM. The reviewers above have extensive gas distribution backgrounds and therefore scene setting by the Network could be kept to giving context to RIGS in its Network environment. There will be no requirement during the visit to review or understand the types of work carried out in relation to gas leakage, service or mainlaying work. The emphasis is in the processes, systems and management of processes relating to RIGS data

The reviewers have been through the blueprint processes and have received inputs from the centre which will be compared with Network practice. It is hoped to receive different information - complementary and additional.

In broad terms, the visit requirement is to discuss and view

- The working processes for job types that cause planned or unplanned customer interruptions in the Network.
- The associated documents and computer systems used by Transco and their Contractors relating to the collection and recording of RIGS data at all stages of these working processes.
- Control of data quality for RIGS
- Management of errors in RIGS data.
- Data quality improvement plans, actions and results for RIGS
- Error clearance progress and processes

During the visit it is critical that the Network personnel providing input must include those who are involved with the relevant tasks on a day-to-day basis.

The purpose of the network visits is to put the RIGS process in a local context and to understand and investigate:

- Unique Network Issues
- Network understanding of RIGs requirements
- Network RIGs instructions
- Connected end user number updating
- Data issues
- Office procedures
- Administrative issues

The above understanding relates to both direct and contract labour completed work.

There will be a need during the visit to investigate processes and procedures for both INTERRUPTIONS and REPEX work

With specific regards to REPEX reporting it is required to have available statistics and data to cover the following

2003/2004 replacement programme:

- Planned replacement by reportable category
- Planned decommissioning by diameter

2003/2004 results:

- Actual replacement by reportable category
- Actual decommissioning by diameter
- As laid details updated
- Reporting methodology
- Meet applicable operational and admin staff

For both interruptions and REPEX it is intended to follow the data processes and information associated with a number of jobs. The interruptions jobs will be selected from information provided centrally and the REPEX jobs will be selected from local office files and information.

The following is a suggested timetable for the visit to assist Transco in the targeting of resources and information that are required to meet the objectives of the visit

Day 1

- 9.00am Opening meeting – Introductions / Presentation
  Include discussion of process maps as used by Network and RIGS training and implementation

- 12.00 – 12.30 Lunch
- 12.30pm Repair Team (work management end) Follow process – job creation to closure, including all applicable documents and computer systems
- Review with Repair Team sample of closed jobs selected by Network to illustrate RIGS data flows, including validation and jobs in progress
- 3.30-4.00pm Review of the day's events
- 4.00 Close

Day 2

- 9.00am Depot Meeting with nominated ESE(s) / Distribution Team(s) to discuss RIGS to obtain input from those closest to the interruption–including documentation, training, laptops
- 10.00am OFGEM reviewers select random sample of unplanned interruption jobs and review with Network
- 12.00-12.30pm Lunch
- 12.30pm Continue review of sample
- 3.30-4.00pm Review of the day's events
- 4.00 Close

Day 3

- 09.00 Replacement Team (work management end)
- Follow process – job creation to closure, including all applicable documents and computer systems
- Review with Replacement Team sample of closed jobs selected by Network to illustrate RIGS data flows, including validation and jobs in progress
- 12.00-12.30pm Lunch
- 12.30pm OFGEM reviewers select random sample of planned interruption jobs and review with Network
- 3.30-4.00pm Review of the day's events
- 4.00 Close

Day 4

- 9.00am Depot Meeting with nominated TSE's/ Distribution Team(s)/Contract Supervisor and clerical staff to discuss RIGS to obtain input from those closest to the planned interruption–including documentation, training, laptops.
- 10.30am Error Clearance
- 12.00 – 12.30 Lunch
- 12.30pm Discuss MI and Reporting
- 2.00pm Training and Action Plan review
- 3.30pm Review visit overall and possible follow up
- 4.00pm Close

Any requirements for additional work or follow up visits will be identified and discussed with the Network.

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX G

VISIT QUESTIONNAIRE FRAMEWORK

OFGEM RIGS REVIEW MAY 2004 - Network Questionnaire Material

Network	**London**
Name(s)	
Job Title(s)	
Consultant(s)	

Do you know why Transco is collecting data about CIs ?				**Comments**
Transco was already recording data on unplanned interruptions in its Failure to Supply Database - limited to >24h for which Transco is required to make compensation payments to consumers.Interruptions due to third-party damage and water ingress are not included.		**Yes**	**No**	
Transco was required to develop appropriate systems and processes to accurately record both number and duration of non-contractual interruptions at an overall and a disaggregated level.		**Yes**	**No**	
Data recording on interruptions was required to start no later than 1 April 2003.				
When did you commence recording CI data?				
Have you received training about the data to be collected?		**Yes**	**No**	
How were you trained? A. Team Briefing ? B. Classroom ? C. On the job ?				
Did the training enable you to understand what you need to do give the right information ?		**Yes**	**No**	
Is the effectiveness of the training reviewed ?		**Yes**	**No**	
If YES how often?				
Have you received feedback about the data you are recording - its accuracy, completeness?		**Yes**	**No**	
How is the feedback given?				
Contract/Direct Labour What do you write the times on? How do you record the times that the interruptions begin /end ?				
Office staff What systems do you use to record interruptions data ?		**STORMS**	**EMW**	**Other**
How have you dealt with any errors/have you received any further training or support about the times to be collected and how to do it to meet the Regulations?(Describe)				
Do you know what your Team/ Network is doing to reduce errors and improve the quality of the CI information?		**Yes**	**No**	
If YES what?				
Interruptions				
Definitions				
A Network Consumer - any premises or independent network supplied from Transco's Distribution Networks.		**Yes**	**No**	
A non-contractual interruption is a non contractual loss of supply upstream of, or at, the emergency control valve (ECV) to a Network consumer. - includes planned and unplanned contractual interruptions		**Yes**	**No**	
A planned non-contractual interruption is a non-contractual interruption of supply that results from a planned activity - including all non- contractual interruptions resulting from consumer/shipper-initiated service alterations, consumer-initiated mains diversions,Transco-initiated planned programmes of work such as bulk service replacement, mains replacement driven bulk service transfers or replacement. A relay and subsequent transfer counts as two non-contractual interruptions.		**Yes**	**No**	
An unplanned non-contractual interruption is a non-contractual interruption of supply that results from an unplanned activity - including all non- contractual interruptions resulting from unplanned activities such as leaking services, third party action ***(review re other cases)***		**Yes**	**No**	
The start of an interruption is the start date and time that is the earlier of:				

Network Questionnaire Page 1

The end of an interruption is the end date and time that is the earlier of:				
A. re-commissioning of consumer appliances (where safe to do so)		**Yes**	**No**	
B. notification to the consumers address that gas can be restored to the premises when access can be arranged (whereTransco cannot gain access)		**Yes**	**No**	
C. notification to the consumer, or to the consumer's address, that there are considerations outside Transco's control preventing restoration of supply, following notification from Transco that the supply could be restored the consumer requests delay, or reconnection is subject to notification of a dispute.		**Yes**	**No**	
Are you encouraged/incented to collect interruptions data accurately ?		**Yes**	**No**	
If YES how				
Are these arrangements regularly reviewed ?		**Yes**	**No**	
If YES how often				
Network Management				
What is the Network's procedure for ensuring compliance with the RIGs for Customer Interruptions?				
Referring to the process maps, where in the process(es) does the Network check the accuracy of the Customer Interruptions data?				
How does the Network check the accuracy of the Customer Interruptions data on a day-to-day basis?				
How does the Network check the accuracy of the Customer Interruptions data submitted to Ofgem?				
What formal record of the above checks is held?				
How does the Network assess the accuracy of the data?				
What is the Network's current assessment of the accuracy of the data?				
By how much has the accuracy of the data improved each quarter ?				
What assumptions has the Network made in assessing this accuracy?				
What is the significance to the Network of these accuracies ?				
Who has the responsibility for the data reported to Centre ?				
What is the main causes of errors in your opinion ?				
What are the reasons for no CI information being available for some jobs?				
How are you addressing these errors ?				
How are you monitoring the effectiveness of these measures?				
What are the results of these measures?				
How many staff are involved in error correction ?				
How are the staffing levels for error correction determined ?				
What differences are there between the number of errors generated by direct labour compared to contract labour ?				
What differences are there between the type of errors generated by direct labour compared to contract labour ?				
What is the Network's improvement action plan?				
Please show the details of the action plan.				
What are Network's priorities for action?				

Network Questionnaire Page 2

Why are these the priorities?		
How is the action plan implemented in the Network?		
How have the benefits of the actions taken been measured?		
What were the results of this measurement?		
How will the benefits been reviewed?		
What is the formal review process?		
How are these reviews recorded?		
Please show me these records? (Describe/record evidence.)		
How is best practice shared between Networks?		
What best practices from other Networks has this Network implemented?		
Training		
When did RIGs training start?		
Where is RIGs training recorded?		
Please show me these records? (Describe/record evidence.)		
How have you/the Network measured the results of this training		
What are the results of this measurement?		

Network Questionnaire Page 3

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

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APPENDIX H

INTERRUPTIONS AND REPEX DATA

DATA COLLECTION FORMATS

From Sample List Enter STORMS Ref as mininimum. Check other sample list, info as available.	Job Type	Consumer Type	Priority	Originating EMW Reference	STORMS Reference *		PUR Reference	Duration

		EMW	STORMS	Pre-STORMS	PUR	Duration	Comments
	Start Time						
	Start Date						
	End Time						
	End Date						
	Duration						
	Error Management (where identified)						
	Start Time						
	Start Date						
	End Time						
	End Date						
	Duration						
	Consultant		Date				
	* Request details of additional interruptions recorded against this STORMS reference - if available, complete separate sheet.						

WilcockConsulting/Ofgem/RIGsReview/CI/SplChecklist/Scot/v1.0

Customer Interruption Data Checklist

Repex Reporting - Network data Checklist				
Network				
Decommissioned Mains ID				
Length decommissioned				
STORMS WR number				
Main size				
Material				
Address				

Associated Mains Work

Decommissioned Mains ID	Length	Size	Material	STORMS WR Number

Relay Mains ID	Length	Size	Material	STORMS WR Number

Associated Service Work

Services transferred	
Domestic services relaid	
Non domestic services relaid	

Comments

Consultant	

Repex Data – Network Data Checklist

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX I

CUSTOMER INTERRUPTIONS REPORT

QUARTER 4 – 2003/2004

Network	Number of Interruptions per 100 Consumers in each Network	Average Duration of each Interruption in each Network (minutes)	Number of Interruptions in each Network	Total Interruptions Duration in each Network (minutes)	Number of Consumers in each Network
Scotland	0.1051	981	1,784	1,750,750	1,697,056
North of England	0.2111	1,079	5,201	5,611,371	2,463,582
North West	0.5886	838	15,620	13,094,486	2,653,693
East of England	0.3122	943	12,083	11,392,695	3,869,821
West Midlands	0.5871	690	11,255	7,765,336	1,917,077
Wales and the West	0.2468	1,642	5,829	9,573,599	2,361,372
South of England	0.2884	1,759	11,352	19,965,837	3,936,694
London	0.4116	1,114	9,269	10,322,584	2,251,884
Transco Total	0.3423	1,098	72,393	79,476,658	21,151,179

The Number and Duration of Non-Contractual Interruptions, (by Network)
Reporting Period : 01/01/2004 to 31/03/2004

Network Name	Consumer Type	Number of Interruptions per 100 Consumers in each Network by Consumer Type	Average Duration of each Interruption in each Network by Consumer Type (minutes)	Number of Interruptions in each Network by Consumer Type	Total Interruptions Duration in each Network by Consumer Type (minutes)	Number of Consumers in each Network by Consumer Type
Scotland	Domestic Non Priority	0.1080	988	1,712	1,692,242	1,585,145
	Domestic priority	0.0816	815	51	41,545	62,530
	Non Domestic	0.0306	778	15	11675	49,014
	Total CSEP	1.6349	881	6	5,288	367
	Network Total	0.1051	981	1,784	1,750,750	1,697,056
North of England	Domestic Non Priority	0.2092	1,076	4,878	5,247,374	2,331,518
	Domestic priority	0.4000	1,246	249	310293	62,246
	Non Domestic	0.0202	3,114	14	43,599	69,185
	Total CSEP	9.4787	168	60	10105	633
	Network Total	0.2111	1,079	5,201	5,611,371	2,463,582
North West	Domestic Non Priority	0.5777	834	14,303	11,927,001	2,475,794
	Domestic priority	1.2310	849	1225	1040291	99,515
	Non Domestic	0.1131	1,442	88	126,894	77,819
	Total CSEP	0.7080	75	4	300	565
	Network Total	0.5886	838	15,620	13,094,486	2,653,693
East of England	Domestic Non Priority	0.3122	941	11,351	10,678,102	3,635,848
	Domestic priority	0.5340	951	672	639292	125,837
	Non Domestic	0.0468	1,480	50	73,981	106,859
	Total CSEP	0.7831	132	10	1320	1,277
	Network Total	0.3122	943	12,083	11,392,695	3,869,821
West Midlands	Domestic Non Priority	0.5695	688	10,104	6,950,418	1,774,269
	Domestic priority	1.2135	709	1091	773963	89,904
	Non Domestic	0.1125	693	59	40,895	52,452
	Total CSEP	0.2212	60	1	60	452
	Network Total	0.5871	690	11,255	7,765,336	1,917,077
Wales and the West	Domestic Non Priority	0.2485	1,602	5,486	8,790,592	2,207,598
	Domestic priority	0.3840	2,341	316	739876	82,295
	Non Domestic	0.0312	1,886	22	41,486	70,555
	Total CSEP	0.5411	329	5	1645	924
	Network Total	0.2468	1,642	5,829	9,573,599	2,361,372
South of England	Domestic Non Priority	0.2869	1,748	10,594	18,522,196	3,692,477
	Domestic priority	0.5340	1,930	652	1258566	122,103
	Non Domestic	0.0858	1,777	104	184,817	121,188
	Total CSEP	0.2160	129	2	258	926
	Network Total	0.2884	1,759	11,352	19,965,837	3,936,694
London	Domestic Non Priority	0.4111	1,104	8,620	9,519,833	2,096,720
	Domestic priority	0.7325	1,252	503	629548	68,669
	Non Domestic	0.1669	1,201	144	172,882	86,264
	Total CSEP	0.8658	161	2	321	231
	Network Total	0.4116	1,114	9,269	10,322,584	2,251,884
Transco	Domestic Non Priority	0.3386	1,094	67,048	73,327,758	19,799,369
	Domestic priority	0.6674	1,142	4,759	5,433,374	713,099
	Non Domestic	0.0783	1,404	496	696,229	633,336
	Total CSEP	1.6744	214	90	19,297	5,375
	Total Networks	0.3423	1,098	72,393	79,476,658	21,151,179

The Number and Duration of Non-Contractual Interruptions,
(by Network, by Consumer Type)
Reporting Period : 01/01/2004 to 31/03/2004

Network Name	Cause Type Description	Number of Interruptions per 100 Consumers in each Network	Average Duration of each Interruption in each Network (minutes)	Number Of Interruptions In Each Network	Total Interruptions Duration In Each Network (minutes)	Number Of Consumers In Each Network
Scotland	Consumer/Shipper Initiated Service Alteration	0.0388	390	658	256,636	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.0342	1,631	581	947,555	
	Network Total	0.0730	972	1,239	1,204,191	1,697,056
North of England	Consumer/Shipper Initiated Service Alteration	0.0128	164	316	51,935	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.1685	1,172	4,152	4,867,869	
	Network Total	0.1814	1,101	4,468	4,919,804	2,463,582
North West	Consumer/Shipper Initiated Service Alteration	0.0304	145	808	117,343	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.4937	766	13,100	10,036,420	
	Network Total	0.5241	730	13,908	10,153,763	2,653,693
East of England	Consumer/Shipper Initiated Service Alteration	0.0452	124	1750	217,244	
	Consumer Initiated Mains Diversion	0.0001	369	2	737	
	Transco Initiated	0.2350	1,109	9096	10,085,435	
	Network Total	0.2803	950	10,848	10,303,416	3,869,821
West Midlands	Consumer/Shipper Initiated Service Alteration	0.0210	129	402	51,894	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.5181	556	9,933	5,518,069	
	Network Total	0.5391	539	10,335	5,569,963	1,917,077
Wales and the West	Consumer/Shipper Initiated Service Alteration	0.0471	330	1112	367,293	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.1820	2,020	4,298	8,680,256	
	Network Total	0.2291	1,672	5,410	9,047,549	2,361,372
South of England	Consumer/Shipper Initiated Service Alteration	0.0445	246	1752	430,321	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.1907	1,877	7,509	14,093,257	
	Network Total	0.2352	1,568	9,261	14,523,578	3,936,694
London	Consumer/Shipper Initiated Service Alteration	0.0413	186	931	173,184	
	Consumer Initiated Mains Diversion	0.0000	0	0	0	
	Transco Initiated	0.2956	891	6,657	5,929,926	
	Network Total	0.3370	804	7,588	6,103,110	2,251,884
Transco	Consumer/Shipper Initiated Service Alteration	0.0365	216	7,729	1,665,850	
	Consumer Initiated Mains Diversion	0.0000	369	2	737	
	Transco Initiated	0.2616	1,087	55,326	60,158,787	
	Total Networks	0.2981	980	63,057	61,825,374	21,151,179

The Number and Duration of Non-Contractual Interruptions, (by Network, by Planned)
Reporting Period : 01/01/2004 to 31/03/2004

Network Name	Cause Type Description	Number of Interruptions per 100 Consumers in each Network	Average Duration of each Interruption in each Network (minutes)	Number Of Interruptions in each Network	Total Interruptions Duration in each Network (minutes)	Number of Consumers in each Network
Scotland	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0235	1,176	399	469,197	
	Mechanical Pipe/Plant Failure	0.0023	195	39	7592	
	Non Mechanical Pipe/Plant Failure	0.0001	30	1	30	
	NTS (Upstream) Failure	0.0000	0	0	0	
	Third Party Action	0.0062	658	106	69,740	
	Network Total	0.0321	1,003	545	546,559	1,697,056
North of England	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0222	1,132	546	617,896	
	Mechanical Pipe/Plant Failure	0.0003	1,006	8	8049	
	Non Mechanical Pipe/Plant Failure	0.0001	147	2	294	
	NTS (Upstream) Failure	0.0000	0	0	0	
	Third Party Action	0.0072	369	177	65,328	
	Network Total	0.0298	943	733	691,567	2,463,582
North West	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0470	2,220	1,248	2,770,536	
	Mechanical Pipe/Plant Failure	0.0001	2,570	3	7711	
	Non Mechanical Pipe/Plant Failure	0.0001	7,607	2	15213	
	NTS (Upstream) Failure	0.0000	0	0	0	
	Third Party Action	0.0173	321	459	147,263	
	Network Total	0.0645	1,718	1,712	2,940,723	2,653,693
East of England	Inadequate Network Capacity	0.0000	435	1	435	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0184	1,129	713	804,690	
	Mechanical Pipe/Plant Failure	0.0018	729	69	50,310	
	Non Mechanical Pipe/Plant Failure	0.0000	90	1	90	
	NTS (Upstream) Failure	0.0000	238	1	238	
	Third Party Action	0.0116	519	450	233,516	
	Network Total	0.0319	882	1,235	1,089,279	3,869,821
West Midlands	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0405	2,667	777	2,072,273	
	Mechanical Pipe/Plant Failure	0.0001	270	1	270	
	Non Mechanical Pipe/Plant Failure	0.0000	0	0	0	
	NTS (Upstream) Failure	0.0000	0	0	0	
	Third Party Action	0.0074	865	142	122,830	
	Network Total	0.0480	2,386	920	2,195,373	1,917,077
Wales and the West	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0133	1,474	315	464,200	
	Mechanical Pipe/Plant Failure	0.0000	314	1	314	
	Non Mechanical Pipe/Plant Failure	0.0000	0	0	0	
	NTS (Upstream) Failure	0.0000	0	0	0	
	Third Party Action	0.0044	597	103	61,536	
	Network Total	0.0177	1,255	419	526,050	2,361,372
South of England	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0395	3,243	1554	5,039,419	
	Mechanical Pipe/Plant Failure	0.0008	678	32	21,691	
	Non Mechanical Pipe/Plant Failure	0.0012	1,375	48	66,015	
	NTS (Upstream) Failure	0.0000	0	0	0	
	Third Party Action	0.0116	690	457	315,134	
	Network Total	0.0531	2,603	2,091	5,442,259	3,936,694
London	Inadequate Network Capacity	0.0000	0	0	0	
	> 1:20 Conditions Exceeded	0.0000	0	0	0	
	Leaking Service	0.0637	2,699	1,435	3,873,709	
	Mechanical Pipe/Plant Failure	0.0000	0	0	0	
	Non Mechanical Pipe/Plant Failure	0.0000	0	0	0	

The Number and Duration of Non-Contractual Interruptions,
(by Network, by Unplanned)
Reporting Period : 01/01/2004 to 31/03/2004

Network Name	Cause Type Description	Incident Name	Number of interruptions in each Network Incident	Average Duration of each Interruption in each Network Incident (minutes)	Total Interruptions Duration In Each Network Incident (minutes)
East of England	Mechanical Pipe/Plant Failure	EE_270104_01	351	1,413	495,994
North of England		SE_12030401283	960	n/a	n/a
South of England		n/a	2,672	n/a	n/a
	Network Total		3,983	1,413	495,994

	Cause Type Description	Number of Incidents	Number of Incident Related Interruptions by Cause Type	Average Duration of Incident related Interruptions by Cause Type (minutes)	Total Interruptions Duration (minutes)
Transco Total	Consumer/Shipper Initiated Service Alteration	0	0	0	0
	Consumer Initiated Mains Diversion	0	0	0	0
	Transco Initiated	0	0	0	0
	Inadequate Network Capacity	0	0	0	0
	> 1:20 Conditions Exceeded	0	0	0	0
	Leaking Service	0	0	0	0
	Mechanical Pipe/Plant Failure	1	351	1,413	495,994
	Non Mechanical Pipe/Plant Failure	0	0	0	0
	NTS (Upstream) Failure	0	0	0	0
	Third Party Action	0	0	0	0
	Total Networks	1	351	1,413	495,994

The Number and Duration of Non-Contractual Interruptions, (by Network, by Major Incident)
Reporting Period : 01/01/2004 to 31/03/2004

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

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APPENDIX J

REPEX AND SUPPLEMENTARY DATA

2002/2003

Mains Replacement

Total Networks

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	351	</=75mm	461
4-5"	679	>75-125mm	593
6-7"	475	>125-180mm	404
8-9"	425	>180-250mm	347
10-12"	452	>250-355mm	339
>12"	255	>355mm	151

Scotland

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	91	</=75mm	61
4-5"	54	>75-125mm	50
6-7"	37	>125-180mm	30
8-9"	35	>180-250mm	31
10-12"	36	>250-355mm	15
>12"	13	>355mm	8

North of England

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	60	</=75mm	91
4-5"	103	>75-125mm	85
6-7"	65	>125-180mm	62
8-9"	67	>180-250mm	66
10-12"	66	>250-355mm	59
>12"	41	>355mm	26

North West

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	88	</=75mm	82
4-5"	75	>75-125mm	80
6-7"	35	>125-180mm	44
8-9"	47	>180-250mm	29
10-12"	45	>250-355mm	41
>12"	46	>355mm	35

East of England

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	34	</=75mm	93
4-5"	136	>75-125mm	92
6-7"	80	>125-180mm	58
8-9"	57	>180-250mm	42
10-12"	64	>250-355mm	47
>12"	50	>355mm	17

West Midlands

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	13	</=75mm	18
4-5"	44	>75-125mm	57
6-7"	72	>125-180mm	59
8-9"	57	>180-250mm	45
10-12"	83	>250-355mm	77
>12"	39	>355mm	27

Wales & The West

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	29	</=75mm	49
4-5"	77	>75-125mm	43
6-7"	65	>125-180mm	58
8-9"	57	>180-250mm	61
10-12"	58	>250-355mm	50
>12"	17	>355mm	8

South of England

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	16	</=75mm	38
4-5"	100	>75-125mm	84
6-7"	74	>125-180mm	67
8-9"	79	>180-250mm	60
10-12"	79	>250-355mm	36
>12"	25	>355mm	11

London

Mains Decommissioned (Internal Diameter)	Mains Decommissioned (km)	Replacement Mains Installed (External Diameter mm)	Replacement Mains Installed (km)
2-3"	18	</=75mm	29
4-5"	90	>75-125mm	103
6-7"	48	>125-180mm	27
8-9"	26	>180-250mm	13
10-12"	19	>250-355mm	15
>12"	25	>355mm	19

Services Replacement

Number	Services Decommissioned and not replaced	Services Transferred	Replacement Services Installed					
			Non-Domestic	Domestic				Total Domestic & Non Domestic
				Mains Replacement	Leakage	Condition	Total Domestic	
Scotland	3,576	3,883	18	3,629	3,048	4,567	11,244	11,262
North of England	8,858	8,954	230	9,860	6,179	8,258	24,297	24,527
North West	8,570	11,123	79	10,623	6,738	5,762	23,123	23,202
East of England	6,309	12,765	120	10,967	5,559	7,332	23,858	23,978
West Midlands	3,574	3,892	145	3,757	4,732	6,327	14,816	14,961
Wales & The West	5,117	5,800	356	5,195	4,707	7,325	17,227	17,583
South of England	5,607	8,038	47	6,981	10,803	8,171	25,955	26,002
London	7,996	8,586	108	10,029	5,708	3,284	19,021	19,129
Total Networks	49,607	63,041	1,103	61,041	47,474	51,026	159,541	160,644

<7bar Rechargeable Diversion Schemes

Km	Total
Scotland	10
North of England	19
North West	13
East of England	12
West Midlands	11
Wales & The West	10
South of England	13
London	10
Total Networks	99

NTS / LTS Rechargeable Diversion Schemes

Number	Total
Scotland	0
North of England	0
North West	1
East of England	3
West Midlands	0
Wales & The West	0
South of England	0
London	1
Total Networks	5
NTS	1

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

RIGS REPORTING

APPENDIX K

PROPOSED AUDIT FRAMEWORK

GAS INDUSTRY RIGS REPORTING

CUSTOMER INTERRUPTIONS - PROPOSED AUDIT FRAMEWORK

1. INTRODUCTION

This audit framework is designed to allow for any future changes to the gas transportation industry and is therefore not intended to be specific to the current Transco structure. The current audit is on Transco's reporting of customer interruptions and REPEX activity, but as required by Ofgem this proposed audit framework covers only customer interruptions.

2. PREPARATORY WORK

2.1 Previous Year's Reports

Ofgem provides copies of the previous year's reports to enable the audit team to start to analyse the data and look for any obvious anomalies before any formal contact with the Network Operator.

2.2 Head Office Visit

It is important that the audit team visits the Network Operator's head office in order to be briefed on the company's RIGs instructions to operational and admin staff, reporting system(s), training packages and action plans.

2.3 Forms and Questionnaires

The audit team will need to produce questionnaires and forms to support audit activities and the records of the Network visits, and also to assist consistency during visits to different Networks.

2.4 Sampling

The Network Operator should provide the audit team with details of the base information used to generate the customer interruptions RIGs reports as an Excel spreadsheet. This will allow the audit team to pick a random selection of reported interruptions to audit during the Network visits. The audit team will give the Networks sufficient notice to enable them to prepare the necessary supporting documentation.

3. AUDIT FORMAT

In order to ascertain the Network Operator's compliance with the RIGs requirements for customer interruptions reporting it is necessary to ask the following questions:

- Does the Network Operator understand the RIGs definitions as stated?
- Has the Network Operator established and categorised correctly all those job types that fall within the reporting requirements?
- Has the Network Operator provided reports when required?
- Do the report formats comply with RIGs requirements?
- Are the calculations used within the reports accurate?

During the review, checks by the audit team will cover following areas:

- Examination of the content of training materials
- Questioning of individuals both at head office and in the Networks
- Assessment of the Network Operator's job codes relevant to RIGs job types
- Assessment of data used for the extraction and reporting of RIGs information
- Assessment of the RIGs reports provided to Ofgem by the Network Operator on a quarterly basis
- Examination of data presented in the reports to check arithmetical accuracy

4. NETWORK VISITS

4.1 Network Management Input

During the Network visits the Networks should be prepared to discuss:

- Any unique Network Issues
- The Network's understanding of RIGs requirements
- Any specific Network RIGs instructions
- Any data issues
- Specific RIGs related office procedures and administrative issues

4.3 Network Resources Required

For the Network visits the audit team will require:

- A suitably sized room
- Copies of any manual paperwork relevant to the sample
- Access to management, staff and contractors involved with customer interruptions
- Experienced staff to access to the relevant computer systems

4.3 Audit Team Activities

During the Network visits the audit team will:

- Talk to management, staff and contractors to ascertain their level of understanding of the requirements for RIGs reporting, and the reasons behind them
- Compare the start and end times of the chosen samples with those recorded on the work management system(s)

5. ANALYSIS OF RESULTS

5.1 Accuracy of Measurement Systems

There are three primary requirements in respect of the accuracy of systems measuring customer interruptions:

- The data must be complete in the work management system(s)
- The data recorded must be correct in the work management system(s)
- The data transferred from each system and then reported for the RIGS must match.

The analysis will report the findings in respect of these accuracy requirements.

The accuracy of the CI data itself may require interpretation with the help of the Network Operator, as appropriate, of a range of data from the work management system(s) in order to make an informed judgement. This aspect of assessment of accuracy is, therefore, relatively subjective and can be very time consuming.

5.2 Accuracy of Reported Numbers and Duration

For each quarterly reporting period covered by the audit, The Network Operator will make available to the audit team the numbers of jobs for those job types with which one or more non-contractual customer interruption may be associated. These numbers will give a reference against which the audit team can compare the numbers reported successfully under the RIGs. The Network Operator may wish to qualify these numbers in advance with information regarding reasons for variation of numbers of relevant jobs in their system from those reported to Ofgem.

6. FINAL AUDIT REPORT

The audit report should include the following headings as a minimum:

6.1 Summary

A one-page summary including the aims of the audit, description of the Network Operator's reporting system, the main findings of the audit and reference to the recommendations.

6.2 Introduction

A more detailed explanation of the background and requirements of RIGs, the aims of the audit, the scope of the audit, and the structure of the report.

6.3 Methodology

A detailed explanation of the method of sampling and audit preparation used.

6.4 Results

Detailed results of the audit.

6.5 Audit Recommendations

Details of any recommendations to both the Network Operator and Ofgem.

6.6 Lessons Learned

Details of any lessons learned during the audit period, together with any problems encountered.

ASSESSMENT OF TRANSCO'S MEASUREMENT SYSTEMS

AND

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APPENDIX L

ANALYSIS OF CI SAMPLES

1. Tables

Analysis of CI Sample for London Network

Table 12 Quarter 3 Summary by Interruption Category

Table 13 Quarter 3 Error Detail by Interruption Category

Table 14 Quarter 4 Summary by Interruption Category

Table 15 Quarter 4 Error Detail by Interruption Category

Analysis of CI Sample for Scotland Network

Table 16 Quarter 3 Summary by Interruption Category

Table 17 Quarter 3 Error Detail by Interruption Category

Table 18 Quarter 4 Summary by Interruption Category

Table 19 Quarter 4 Error Detail by Interruption Category

2. Observations Regarding Analysis of Samples

Note:

End Reason 1 (ER1) is Gas at exit point but access not available for purge and relight.

End Reason 2 (ER2) is Work complete and notified to the customer.

End Reason 3 (ER3) indicates a purge and relight request.

Analysis of CI Sample for London Network

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	5	2	40	5	100
	LE	5	3	60	3	60
Planned	SA	2	0	0	0	0
	SR	9	4	44.4	9	100

Table 12: Quarter 3 Summary by Interruption Category

	Interruption Category	Job Type	Reported CML	'Actual' CML	Comment
Unplanned	3P	ERSD	19086	?	Incorrect link between EMW jobs at different locations +
		ERSD	2	118	Incorrect end time deduced by error correction team. +
	LE	ERS	65131	?	Original EMW job not the start of interruption +
		SPRE	20041	?	EMW jobs not linked correctly. Interruption occurred on final day. +
		ERS	164283	?	No CI details collected on manual STORMS job card. Details suggest gas at exit point within 48 min after Distribution job start. Error caused by incorrect dates and times entered on EMW to clear job in system +
Planned	SA	SA			Nil errors found
	SR	SPDL	45070	185	Incorrectly linked STORMS & EMW +
		SPDL	1760	240	Gas available at exit point on Day 1 & card could have been dropped to end interruption; appears PUR job held by contractor until customer available +
		SDNL	1590	1590	From information re adjoining property appears PUR job could have been completed previous day if customer available
		SRNL	1985	300	Service relaid Day 1 with PUR same day, service transfer Day 2 with 2nd PUR. Process change has been made: Network now raises a 2nd job so that two CIs can be identified. +

Table 13: Quarter 3 Error Detail by Interruption Category

Analysis of CI Sample for London Network Ctd

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	5	2	40	3	60
	LE	6	2	33	2	40
Planned	SA	2	0	0	0	0
	SR	8	2	25	8	100

Table 14: Quarter 4 Summary by Interruption Category

	Interruption Category	Job Type	Reported CML	'Actual' CML	Comment
Unplanned	3P	ERSD	1472	217	Incorrect end time deduced by error correction team. **+**
		ERSD	4	?	Escape on building site. Not clear that any interruption occurred
	LE	ERS	18824	?	Mains repair. Not reportable as an interruption **+**
Planned	SA				Nil Errors found
	SR	ST	1845	460	Incorrectly linked STORMS ref & EMW **+**
		SPDL	7550	90	Incorrectly linked STORMS ref & EMW; changed working practice agreed 10 Mar 04 to overcome similar errors **+**

Table 15: Quarter 4 Error Detail by Interruption Category

+ Jobs such as these have 'actual' CML times so different from those captured that there is a significant impact on the accuracy of average durations reported to Ofgem for their Interruption Category.

Analysis of CI Sample for Scotland Network

	Interruption Category	No. Jobs Audited	No. Jobs with Error Found	% Error	No. PUR Recorded	% PUR Recorded
Unplanned	3P	7	1	14.3	0	0
	LE	6	4	66.7	0	0
Planned	SA	7	1	14.3	0	0
	SR	10	5	50	4	40

Table 16: Quarter 3 Summary by Interruption Category

	Interruption Category	Job Type	Reported CML (min)	'Actual' CML (min)	Comment
Unplanned	3P	ERSD	15	90	Start and finish on EMW **+**
	LE	SEDL	315	357	PUR omitted, ER1 given in STORMS instead of ER3
		ERS	60	78	PUR omitted, ER1 given in STORMS instead of ER3
		SEDL	60	60	Not an interruption or LE, internal and external work prior to renewal to avoid interruption. Subject to interpretation
		SEDL	46155	1635	Time of last site check recorded on STORMS job card, work completed day after job started. CML approx 1635min **+**
Planned	SA	SODL	9752	?	Service work to fit a MCV. Probably not a reportable interruption. **+**
	SR	ST	98100	30	Linked in EMW to a Job in Derby **+**
		ST	495	510	ER1; PUR info missing
		ST	40230	?	Relay with subsequent transfer, 2 interruptions, No PUR Records **+***
		SPDL	31667	?	Relay with subsequent transfer, 2 interruptions, No PUR Records **+***
		SPDL	31645	?	Failed on QB5, Passed thro STORMS by manual intervention. Relay with subsequent transfer, 2 interruptions **+***

Table 17: Quarter 3 Error Detail by Interruption Category

+ Jobs such as these have 'actual' CML times so different from those captured that there is a significant impact on the accuracy of average durations reported to Ofgem for their Interruption Category.

***** Service replacement projects now use two STORMS jobs to enable the interruptions for the service relay and service transfer to be captured.

Analysis of CI Sample for Scotland Network (ctd)

	Interruption Category	Number Audited	Number with Error Found	% Error	PUR Recorded	% PUR Recorded
Unplanned	3P	7	2	28.6	1	14.3
	LE	7	4	57.1	2	28.6
	MF	6	0	0	3	50
	NM	1	0	0	0	0
Planned	SA	7	3	42.9	0	0
	SR	10	2	20	6	100

Table 18:Quarter 4 Summary by Interruption Category

	Interruption Category	Job Type	Reported CML	'Actual' CML	Comment
Unplanned	3P	ERSD	75	110	CML deduced from EMW & STORMS +
		ERSD	165	188	CML deduced from EMW & STORMS
	LE	ERS	8580	?	Appears to be temp repair & await customer, followed by permanent repair 2 jobs; recorded as start to end of both. Reportable CML probably much shorter.
		ERS	73	126	No STORMS ref on PUR +
		ERS	30	277	End reason 2 not 1 in STORMS +
		ERS	53254	?	Incorrectly recorded, pressure problem, possibly only affecting customer on first day work by distribution team +
Planned	SA	SODL	240	?	ER1 (Gas at exit point) in STORMS. From EMW CML could have been 1356min.
		SA	131265	225	Transcription error in STORMS +
		SA	30	90	Completed on EMW Job without correct explanation. ER1 given on STORMS +
	SR	SPDL	89596	?	EMW & STORMS jobs not related +
		ST	63770	?	EMW & STORMS jobs not related +

Table 19:Quarter 4 Error Detail by Interruption Category

+ Jobs such as these have 'actual' CML times so different from those captured that there is a significant impact on the accuracy of average durations reported to Ofgem for their Interruption Category.

2. Observations Regarding Analysis

1. The jobs where errors were recorded during the review were those where it was either clear that CI data entered was incorrect or it was agreed by the audit team and Transco that circumstantial data indicated that CI data entered was incorrect.

2. For example, a STORMS reference linking CI start and end times of unconnected EMW jobs in different geographical locations is clearly incorrect. However, there are jobs with interruption start and end times recorded in STORMS, for which there is also data in EMW, not linked to a STORMS reference, yet recording a purge and relight at the job address on the same day. These require interpretation to decide the probable end time of the interruption.

4. Low incidence of recording of purge and relights is not conclusive evidence of error but, at this stage of CI reporting, it is an indicator of potential incorrect recording practice and error. Therefore, purge and relights have been included in the results.

5. It is important to note that for some jobs the information on the systems is such that relatively subjective interpretation is required in order to form views on the accuracy of the CML. For example, a CI end time in STORMS matched the time of the last site safety check for the job, some days after physical completion of the work generating the CI. In this case, it was not possible to assess the actual CML reliably. However, the estimate of 1,635 minutes, based on a worst case of the end time being the last action on the relevant working day, compares with 46,155 minutes reported. This interpretation helps to illustrate the impact of inaccuracy on CMLs reported to Ofgem.

6. The accuracy of the above times is fundamental to the reporting process and relies on the understanding and correct interpretation of the above definitions by Transco staff and contractors of what is applicable to each job involving customer interruption. Also, reasons for approximation of some of these times and the significance of such approximation in the overall context of delivery of value and service to the customer need to be understood by both Ofgem and Transco.

7. For jobs where it is appropriate to take the interruption start and end times from those recorded by the distribution team, access to STORMS alone may be sufficient to check that the times are consistent with other information available for that job. For example, using job start and end times, job type and work method, the reviewers with help of Transco, as required, can make an assessment regarding the order of interruption time reported. For illustration, a longer than expected CML could indicate that start and finish times for all work on site are being reported in the STORMS construction unit provided to collect interruption details instead of the actual interruption start and end times.

9. It may be that some or all interruption times collected in STORMS for a particular job should have been collected in EMW together with a reference to the STORMS job to enable the extraction of the CML from the Data Warehouse. Therefore, it was necessary for the review to include some checks of work recorded in EMW at the STORMS job address at or about the time of the STORMS job in order to form a further view about interpretation of the definitions by the Networks and accuracy of the CML.

10. Start and or end times recorded by a service engineer using the EMW field system or on a paper record for subsequent entry in EMW may give indicative rather than precise information about CI times for various reasons. In practice, times are

often entered on the record medium, electronic or paper, after completion of the job. Consequently, some of these times may be rounded best estimates. An assessment of the use of this practice was therefore required as part of the review.