

Electricity Distribution Price Control Network Asset Data and Performance Reporting – Network Outputs and Quality of Service Regulatory Instructions and Guidance: Version 2

Document type: Regulatory instructions and guidance

Ref: 75b/11

Date of publication: 03 June 2011

Target audience: Electricity Distribution Network Operators, Independent Distribution Network Operators, Electricity Suppliers, consumers and consumer representatives

Overview:

This document provides instructions and guidance to Electricity Distribution Network Operators to enable them to complete the reporting requirements associated with the fifth price control arrangements (DPCR5) which run from 1 April 2010 to 31 March 2015.

Contact name and details: James Hope

Tel: 0207 901 7029

Email: James.Hope@ofgem.gov.uk

Team: Electricity Distribution Costs and Outputs

Context

This document contains the Electricity Distribution Price Control Network Asset Data and Performance Reporting – Network Outputs and Quality of Service Regulatory Instructions and Guidance (RIGs).

The purpose of this document is to provide a framework to allow Ofgem to collect accurate and consistent asset data and performance information from the Electricity Distribution Network Operators (DNOs). A number of licence conditions require the DNOs to provide us with this information. The key licence conditions for the purposes of this document are standard conditions 44A (Network outputs regime), and 45 (Incentive scheme for quality of service) of the electricity distribution licence.

This version of the guidance will apply for reporting for the year ending 31 March 2011. Revised versions of the guidance may apply for subsequent years.

This document is one of five which together form the entire RIGs associated with DPCR5. The four further documents cover:

- Electricity Distribution Price Control Cost and Revenue Reporting RIGs,
- Electricity Distribution Price Control Connections Reporting RIGs,
- Electricity Distribution Price Control Customer Service Reporting RIGs, and
- Glossary of terms.

Associated Documents

- Electricity Distribution Price Control Review Final Proposals (144/09)

Table of Contents

Summary	1
1. Introduction	3
Background	3
Legal framework	4
Timescales for reporting under the RIGs.	4
The RIGs workbooks	6
Completing the RIGs workbooks	6
Glossary	7
Document Structure	7
2. Instructions for completing network outputs reporting	9
Introduction	9
Use of Network Outputs	10
Definitions and reporting categories	11
Reporting timetable.....	15
Material Changes	16
Annual reporting of Network Outputs.....	18
Network Outputs mid-period review	20
Network Outputs performance assessment.....	22
Instructions and guidance for completing Network Outputs reporting workbook ..	31
Medium-term performance (MTP).....	47
3. Instructions for completing quality of service outputs reporting.	51
QoS Interruptions	51
Updating the connectivity model	65
Output reporting requirements	65
Disaggregation by duration band (pre-arranged and unplanned CI only)	67
Disaggregation by frequency band (higher voltage unplanned CI only)	67
Disaggregation by HV circuit	68
Disaggregation by non quality of service occurrences	70
Short interruptions.....	71
Required level of accuracy for reporting interruptions data	72
Appendices	73
Appendix 1 – Quality of Service Appendix	74
Purpose of SLC 45 information.....	74
Formulae for the purposes of reporting	74
Other formulae	78
SLC 45 Voltage boundaries	81
Auditing and estimating the accuracy of interruptions reporting	83
Appendix 2 – The Authority’s Powers and Duties	86
Appendix 3 - Feedback Questionnaire	88

Summary

The fifth Electricity Distribution Price Control Review¹ (DPCR5) sets the maximum amount of revenue that Distribution Network Operators (DNOs) can recover from customers over a five-year period from 1 April 2010 and places a number of incentives and obligations on the DNOs. We collect data annually to allow us to monitor DNO performance against their incentives, monitor compliance with their price control obligations and to allow analysis between price controls and at the subsequent price control review. Annual data collection also allows Ofgem to identify issues of performance ahead of the next price control review and provide us with a more robust understanding of the DNO business.

The Regulatory Instructions and Guidance (RIGs) provide a framework that enables Ofgem to collect data from DNOs in a consistent format. The RIGs inform DNOs about the information we plan to collect, guide them on how to provide this information and enable the DNOs to put the systems in place to collect the data to the detail we require.

Since we introduced the annual regulatory reporting arrangements in 2005 there have been significant improvements in the quality of data DNOs have provided to us annually and as part of their Forecast Business Plan Questionnaire (FBPQ) submissions. These improvements allowed us to carry out more robust cost comparisons and cost assessments at DPCR5. However, there are still inconsistencies in the data provided to us by DNOs and we will be looking for further improvements in the lead up to the next price control review.

As part of DPCR5 we introduced a number of new incentives and obligations, many of which require us to collect new data from the DNOs. In designing the RIGs associated with DPCR5 we have looked to streamline the approach to collecting the data to avoid duplication and overlaps between data requests.

Rather than establish new RIGs for each of the new price control mechanisms, which would lead to a proliferation of RIGs and a risk of duplication of data requests, we have grouped the data collection according to whether it relates to financial data (ie cost or revenue data), data on network assets and outputs and activity volumes, such as connections, quality of service and environmental volumes, or data related to quality of service including the customer service reporting.

For each of these four areas we have established separate RIGs documents. This means we will collect data on areas such as connections through returns relating to all three RIGs documents depending on whether it is cost, volume or service related.

Our electricity distribution annual report brings together and summarises a number of key indicators of performance in areas such as customer service, connections, the environment and providing network reliability in a cost effective manner. This

¹ Electricity Distribution Price Control Review Final Proposals, December 2009. Ref: 114/09

provides stakeholders with a complete view of performance against each of the price control incentives and allowances. We intend to widen the scope of this report in the future to include the new incentives and obligations introduced in DPCR5.

There are a number of conditions in the electricity distribution licences that require the DNOs to provide the information set out in the RIGs. These licence conditions also provide a procedure by which we can amend the RIGs. As noted in the Electricity Distribution Price Control Network Asset Data and Performance Reporting - Regulatory Instructions and Guidance: Version 1, we stated that we intend to keep the RIGs reporting obligations under review and may seek to change them in light of the recommendations arising from the RPI-X@20 review, experience of reporting and analysing data from the new RIGs and where we identify duplication or gaps in the RIGs data. The conclusions and recommendations from this review are contained in this decision document²; this second version of the RIGs has been developed in the spirit of this approach.

² RIIO: A new way to regulate energy networks, October 2010. Ref: 128/10

1. Introduction

Background

1.1. As part of DPCR5 we introduced a number of incentives and obligations on the DNOs. These include a requirement on the DNOs to commit to deliver a predetermined set of network investment outputs, new standards of performance in providing connections, a requirement to report on the company's business carbon footprint and new incentives related to customer satisfaction with the DNOs' performance.

1.2. We collect data to allow us to monitor DNO performance against these additional incentives and obligations and to ensure compliance against the overall price control. The Regulatory Instructions and Guidance (RIGs) provide a framework that enables Ofgem to collect data from DNOs in a consistent format. The RIGs inform DNOs about the information we plan to collect, guide them on how to provide this information and enable the DNOs to put the systems in place to collect the data to the detail we require.

1.3. We have structured the workbooks differently from those set out in April 2010. We have combined the CRRIG and volume elements of the NADPR reporting into the same workbook. Where possible we have developed the worksheets to show both the costs and volumes together. This will give clear visibility to Ofgem and the DNOs of unit cost analysis as it will be shown directly on the worksheet. We have structured the RIGs in the following way:

- Cost and volumes reporting pack - this includes all data of a financial nature as well as certain elements which were formerly contained in the April 2010 version of the network asset data and performance reporting pack. This workbook includes: DNO performance against the cost baselines we have set as part of the price control review process (looking separately at costs associated with network investment, other direct and indirect expenditure and spending on connections, quality of service and environmental obligations); DNO performance against the revenue allowance we have set as part of DPCR5; and DNO costs associated with pensions, tax and other financial commitments.
- Network asset data and performance reporting – network outputs and quality of service reporting pack - this includes data associated with the type, scale and performance of the physical network. It covers reporting on the new network investment output measures that we have introduced as part of DPCR5 and also covers data on quality of service outputs.
- Connections reporting – this includes data associated with connections data from the DNOs, to allow for the collection and provision of accurate and consistent connections data from the DNOs.
- Customer service reporting - this includes performance against the new broad measure of community satisfaction that we have introduced as part of DPCR5 and

against the telephony standards. We have also included guidance for the guaranteed standards of service to ensure that all DNO reporting obligations are in one place.

Legal framework

1.4. There are a number of different licence obligations that requires the DNOs to provide Ofgem with information. For the network asset data and performance reporting RIGs the following legal framework applies:

- SLC 44A (Network outputs regime) places obligations for reporting on network outputs as set out in chapter 2
- SLC 45 (Incentive scheme for quality of service) places obligations for reporting on quality of service as set out in chapter 3.

1.5. The RIGs include definitions and related instructions and guidance for preparing the annual information submissions. For the avoidance of doubt, these RIGs are subordinate to the licence conditions. Consequently, the RIGs will not change any definitions or obligations contained within the electricity distribution licences applicable to the DNOs and in the event of any dispute, the licence conditions will always take precedence.

Timescales for reporting under the RIGs.

Reporting year

1.6. The relevant reporting year for the provision of information required under SLCs 44A, and 45 runs from 1 April to 31 March of the following calendar year.

Submission dates

1.7. With the exception of the data set out in Table 1.1 and data associated with Network outputs DNOs must provide the information required under SLCs 44A, and 45 as soon as reasonably practicable and in any event, not later than 31 July following the end of the relevant reporting year to which such information relates. This is the latest date that DNOs can submit the information unless the Authority has previously consented otherwise in writing.

1.8. The submission must be accompanied by a letter signed by a director on behalf of the licensee confirming that the data has been provided in accordance with the RIGs.

1.9. With regards to the submission of data for network outputs reporting Table 2.3 sets out the reporting timetable.

1.10. Table 1.1 below sets out the timescales for the submission of reporting data for interruptions and faults.

Table 1.1 Timescales for the submission of data for interruptions and faults

RIGs workbook reference	Reporting data to be provided	Date of submission
QoS interruptions reporting workbook and QoS interruptions stage data reporting workbook	Interruptions	30 April
Non QoS Occurrences	Occurrences that are not reported as interruptions	30 June
QoS HV disaggregation reporting workbook	High Voltage disaggregation data	31 July
Network outputs reporting workbook	Data, commentary and analysis for the health index, fault rate record ³ and load index	30 September (31 July for 2014)

Resubmissions

1.11. Ofgem’s agreement is required before any resubmission of information set out in a report produced in accordance with these RIGs can be made and in any such instance the report concerned must be resubmitted in full. The resubmission must only be accompanied by a letter signed by a director where significant changes have been made and Ofgem or the licensee decide such a letter is required.

1.12. In addition for each resubmission a separate explanation must be provided listing each and every cell that has been amended and sufficient commentary to explain the reasons.

Review

1.13. Once the DNOs have submitted the information to the Authority, Ofgem or a person nominated by the Authority (‘a reviewer’) will undertake a detailed review of the information. Such a review may include a visit to each DNO for discussion of the information submitted. Such visits will be agreed with the licensees in advance.

1.14. Where a reviewer has been nominated, then in accordance with SLC 48.10, the reviewer will enter into an agreement with the licensee to maintain confidentiality on reasonable terms.

³ To avoid duplication, actual fault rate record data will be populated by Ofgem using data provided in the relevant Cost, Volumes and Revenue reporting templates.

Appointing an examiner

1.15. In accordance with SLC 44A.12, and SLC 45.8 the licensee must permit a person nominated by the Authority to examine the systems, processes and procedures for measuring the specified information, the specified information collected by the licensee and the extent to which the systems, process and procedures and the specified information complies with the RIGs.

Auditing interruptions reporting

1.16. Appendix 1 sets out the audit requirements for interruptions reporting.

The RIGs workbooks

1.17. There are six workbooks for the network asset data and performance reporting RIGs. Below is a summary of these workbooks and the worksheets that are contained within them where relevant:

- Network Outputs reporting workbook for reporting on network outputs as specified in chapter 2
- Network Outputs reporting workbook HI tracking for reporting on network outputs as specified in chapter 2
- QoS HV Disaggregation reporting workbook for reporting on quality of service as specified in chapter 3
- QoS Interruptions reporting workbook for reporting on quality of service as specified in chapter 3
- QoS Interruptions stage data reporting workbook for reporting on quality of service as specified in chapter 3
- Non QoS Occurrences workbook for reporting on occurrences outside of quality of service reporting as specified in chapter 3.

1.18. In chapters 2 and 3 we refer to the workbooks themselves, for example we refer to the network outputs.

Completing the RIGs workbooks

Template

1.19. In the RIGs workbooks all the cells that DNOs are required to complete are coloured yellow. Cells with pre inputted values and checking cells are coloured orange and cells which have auto calculations or are totals are coloured green. Cells which are linked to other sheets are coloured blue.

1.20. Values must be entered in the column corresponding to the Regulatory Year under report. For example, values reported in respect of Regulatory Year 2010-11 must be entered in the column headed "2011".

1.21. Instructions for the electronic submission of the workbooks will be circulated to the licensee regulation managers in advance of each submission deadline. However, if there is any doubt about the method of submission, the licensee must contact the Costs and Outputs team at Ofgem.

Accuracy of reporting

1.22. In the RIGs worksheets the numbers will be displayed to two decimal places. However, the DNOs are required to provide this data to the highest level of accuracy available with the minimum being two decimal places, unless otherwise indicated in the worksheets or the guidance. Where a reportable value is zero or not applicable to the licensee then a zero must be input rather than the cell being left blank.

Provision of historic data

1.23. For each worksheet contained within the workbooks, the provision for the reporting of historic data is set out. Subsequently we will require that DNOs report a complete set of historic reporting data using this version of the workbooks for the full period of DPCR4 ie for each year commencing 2005-6. Ofgem will confirm in writing the level of detail that we will require for the historic data. These requirements will be detailed in an open letter when the forecast pack is distributed to DNOs.

Provision of forecast data

1.24. For the reporting year 2010-11 there is no requirement for forecast information to be submitted to Ofgem. Subsequently we will require a full forecast pack to be submitted for the entire DPCR5 and RIIO-ED1 periods. These requirements will be detailed in an open letter when the forecast pack is distributed to DNOs.

1.25. These requirements do not apply to the revenue reporting workbook. Instructions for those workbooks should be followed from the Guidance provided.

Glossary

1.26. The glossary of terms provides a definitive list of definitions for all RIGs documents but excludes terms set out in the licence conditions. Where a term is defined in a RIGs document it can also be found in the glossary of terms.

1.27. For the avoidance of doubt the glossary of terms are subordinate to the licence conditions. Therefore if a term is defined in both the licence and the glossary the licence takes precedence.

Document Structure

1.28. The document contains the following chapters:

- Chapter 2 – sets out the instructions for completing network outputs reporting
- Chapter 3 – sets out the instructions for completing quality of service outputs reporting.

1.29. The appendices consist of the following:

- Appendix 1 – sets out the quality of service appendix
- Appendix 2 – sets out the Authority's powers and duties
- Appendix 3 – sets out the feedback questionnaire.

2. Instructions for completing network outputs reporting

Introduction

2.1. The purpose of this chapter is to provide a framework for the collection and provision of accurate and consistent Network Outputs information from the electricity Distribution Network Operators (DNOs) and to set out a process for the assessment of performance.

2.2. This chapter covers the following areas:

- Use of Network Outputs reporting
- Definitions and reporting categories
- Reporting timetable
- Annual reporting of Network Outputs
- Network Outputs mid-period review
- Network Outputs performance assessment
- Instructions and guidance for completing Network Outputs reporting workbook.

2.3. The Network Outputs reporting is intended to form the basis for informed discussions both during and at the end of a price control period on the benefits delivered by the level of investment undertaken during the price control period. The Network Outputs will make an important contribution to determining whether a DNO has delivered the change in the level of network risk funded by customers as part of the DPCR5 settlement, and will help establish whether any cost savings achieved by a DNO are due to efficiencies achieved during the price control period.

2.4. The Network Outputs specified in this RIG have been developed such that they are:

- measurable, controllable, auditable and replicable over time
- sufficiently aligned with the underlying business processes that are used to plan and operate the network
- sensitive to the level of investment
- able to capture outputs or outcomes such as performance, asset health, network capacity or headroom and network risk.

2.5. Network Outputs are not intended to constrain innovation or encourage inappropriate goal-orientated behaviour. Network Outputs are intended to help demonstrate, track and encourage improvements in asset management over time, the benefits of which should be realised by all interested parties. The Network Outputs developed as part of the settlement may be suitable not only for Ofgem in determining whether customers receive value for money, but also as a useful internal planning and management tool for the DNOs themselves.

2.6. It is recognised that the Network Outputs formulated for these purposes are at an early stage of development, and further improvement is encouraged over the period. The impact on output performance of any new information received during the DPCR5 price control period (eg changes to Health Index modelling), will be taken into account by Ofgem in forming an opinion on any financial consequences to apply in the event that the Delivered Network Outputs are different to those originally forecast (adjusted for the changes that occur over the period).

Use of Network Outputs

2.7. References in this document to the Agreed Network Outputs are references to the outputs (measured in terms of the Load Index, the Health Index and the Fault Rate Record) that form the baseline against which the DNO's future performance will be assessed. Those outputs were specified for the DNO in the Authority's decision document published on 7 December 2009 and are deemed to have been accepted by the DNO by virtue of the Authority's modification, with the licensee's consent, of the Charge Restriction Conditions of the distribution licence effective from 1 April 2010.

2.8. While the Agreed Network Outputs are not a 'hard target' for DNOs to meet, they will form the baseline against which each individual DNO's future performance will be assessed at an overall level by Ofgem. There will be financial consequences for a DNO that Ofgem qualitatively determines has not delivered Network Outputs which reflect the change in the level of network risk funded by customers via the DPCR5 settlement.

2.9. The Agreed Network Outputs come in the form of metrics representing the DNOs':

- current assessments of network health (or fault rates) and utilisation
- forecasts of network health and utilisation at the end of the price control period in the absence of network Intervention
- forecasts of network health (or fault rates) and utilisation at the end of the price control period as a consequence of their proposed load and non-load related network Interventions.

2.10. These initial Network Outputs have been developed against a common methodology and further refinement is expected and encouraged over the course of the price control period.

2.11. The Agreed Network Outputs developed for the DPCR5 price control period will be used:

- as the basis for informed discussions with Ofgem during DPCR5 and at RIIO - ED1 on the level of investment undertaken and planned by a DNO during the DPCR5 period and to assess the likelihood of the DNO delivering the agreed

package of Network Outputs, (or equivalent), in return for the revenues collected from customers

- to distinguish between those companies that have innovated and delivered what customers need more efficiently, and those that have deferred investment at the expense of delivering the agreed levels of network health and/or utilisation (noting that the different internal asset management approaches of each individual DNO means that Network Outputs cannot at this stage be used to compare DNOs directly)
- to demonstrate, monitor and encourage improvements and evolution in DNOs' asset risk management techniques over DPCR5
- as the foundation for further improvements in Network Outputs capabilities in RIIO - ED1 (eg the development of high level network risk or 'tier one' Network Outputs).

2.12. As part of the RIIO - ED1 process Ofgem is to conduct a Network Outputs performance assessment. The purpose of the performance assessment is to determine whether or not a DNO has satisfactorily delivered a package of outputs consistent with the change in the level of risk funded by its customers through the DPCR5 settlement. At a high level, this requires DNOs to provide information to demonstrate that the program of work actually delivered over DPCR5 was in customer's best interests, and for Ofgem to qualitatively determine whether or not this is the case.

Definitions and reporting categories

Definitions

2.13. This section sets out definitions and related instructions and guidance for the reporting of Network Outputs information under the common methodology. The definitions set out below are consistent with, and expand upon, those specified in paragraph A21 of SLC 44A. The following definitions can be found in the glossary:

- **Adjusted network outputs**
- **Agreed network outputs**
- **Annual submission**
- **Delivered network outputs**
- **Demand group**
- **Demand group categories**
- **Distribution asset**
- **Distribution asset categories**
- **Fault rate**
- **Fault rate asset category**
- **Fault rate record**
- **Health index**
- **Health index asset category**
- **Intervention**

- **Load index**
- **Load index logic**
- **Material change**
- **Material change log**
- **Mid-period review submission**
- **Network outputs**
- **Network outputs gap**
- **Network outputs submission**
- **Tier 1 network output measure**
- **Tier 2 network output measure**
- **Tier 3 network output measure.**

Reporting categories

2.14. This section sets out the reporting categories for Network Outputs. DNOs must as a minimum provide updated information for all those reporting categories which are included in the Agreed Network Outputs, in accordance with the agreed reporting dates contained at section 2.18 of this RIG.

2.15. Unless otherwise specified, DNOs are required to report Health Index information for the Health Index Asset Categories set out in table 2.1 below. Table 2.1 expresses a preferred level of granularity, acknowledging that there may be minor variations between DNOs.

Table 2.1: Health Index Asset Categories and corresponding Distribution Asset Categories

Health Index Asset Category	Distribution Asset Category
LV OHL Support	LV Support
LV Switchgear and Other*	LV Pillar (ID) LV Pillar (OD) LV Board (WM)
LV UGB*	LV UGB
HV OHL Support - Poles	6.6/11 kV Support 20 kV Support
HV UG Cable*	6.6/11kV UG Cable 20kV UG Cable
HV Switchgear (GM) - Primary	6.6/11 kV CB (GM) [Primary] 20 kV CB (GM) [Primary]
HV Switchgear (GM) - Distribution	6.6/11 kV CB (GM) [Distribution] 6.6/11 kV Switch (GM) 6.6/11 kV RMU 20 kV CB (GM) [Distribution] 20 kV Switch (GM) 20 kV RMU
HV Transformer (GM)*	6.6/11 kV Transformer (GM) 20 kV Transformer (GM)
EHV OHL Fittings and Conductors (Tower Lines)*	33kV OHL (Tower Line)

	66kV OHL (Tower Line)
EHV OHL Support - Poles	33kV Pole 66kV Pole
EHV OHL Support - Towers	33kV Tower 66kV Tower
EHV UG Cable (Non pressurised)*	33kV UG Cable (Non Pressurised) 66kV UG Cable (Non Pressurised)
EHV UG Cable (Oil)*	33kV UG Cable (Oil) 66kV UG Cable (Oil)
EHV UG Cable (Gas)*	33kV UG Cable (Gas) 66kV UG Cable (Gas)
EHV Switchgear	33 kV CB (ID) 33 kV CB (OD) 33 kV Switch (GM) 33 kV RMU 66 kV CB (ID & OD)
EHV Transformer	33 kV Transformer (GM) 66 kV Transformer
132kV OHL Fittings and Conductors (Tower Lines)	132kV OHL Conductor (Tower Line)
132kV OHL Support - Tower	132kV Tower
132kV UG Cable (Non pressurised)*	132kV UG Cable (Non Pressurised)
132kV UG Cable (Oil)*	132kV UG Cable (Oil)
132kV UG Cable (Gas)*	132kV UG Cable (Gas)
132kV CBs	132kV CB (ID & OD)
132kV Transformer	132 kV Transformer
Submarine Cables*	HV Sub Cable EHV Sub Cable 132 kV Sub Cable

* DNOs to report a Fault Rate Record instead of Health Index information if:
the DNO does not presently have Health Index capability, and / or
it is not economic or practical to collect a full set of Health Index data.

2.16. Unless otherwise specified, DNOs are required to report a Fault Rate Record for the Fault Rate Asset Categories set out in table 2.2 below.

Table 2.2: Fault Rate Asset Categories and corresponding Distribution Asset Categories

Fault Rate Asset Category	Distribution Asset Category
LV Main (OHL)	LV Main (OHL)
LV Service	LV Service (OHL)
LV Main (UG Consac)	LV Main (UG Consac)
LV Main (UG non-Consac)	LV Main (UG Plastic) LV Main (UG Paper)
LV Service (UG)	LV Service (UG)
LV Switchgear*	LV Pillar (ID) LV Pillar (OD) LV Board (WM) LV UGB LV Fuses (PM) LV Fuses (TM)
HV OHL	6.6/11 kV OHL (Open) 6.6/11 kV OHL (Covered) 20 kV OHL (Open) 20 kV OHL (Covered)
HV UG Cable*	6.6/11 kV UG Cable 20 kV UG Cable
HV Switchgear (PM)	6.6/11 kV CB (PM) 20 kV CB (PM)
HV Transformer (PM)	6.6/11 kV Transformer (PM) 20 kV Transformer (PM)
HV Transformer (GM)	6.6/11 kV Transformer (GM) 20 kV Transformer (GM)
EHV OHL Fittings and Conductors*	33 kV OHL (Pole Line) 33 kV OHL (Tower Line) 66 kV OHL (Pole Line) 66 kV OHL (Tower Line)
EHV UG Cable*	33 kV UG Cable (Non Pressurised)
	33kV UG Cable (Oil) 33 kV UG Cable (Gas) 66 kV UG Cable (Non Pressurised) 66 kV UG Cable (Oil) 66 kV UG Cable (Gas)
132kV UG Cable*	132 kV UG Cable (Non Pressurised) 132 kV UG Cable (Oil) 132 kV UG Cable (Gas)
Submarine Cables*	HV Sub Cable EHV Sub Cable 132 kV Sub Cable

- * DNOs to report a Fault Rate Record instead of Health Index information only if:
 - the DNO does not presently have Health Index capability and / or
 - it is not economic or practical to collect a full set of Health Index data.

Note 1: If Health Index information is provided for this category, DNOs to report a fault rate for 'Tower Lines' only (not 'Pole lines').

2.17. Unless otherwise agreed, DNOs are required to report Load Index information for each of the following Demand Group Categories:

- Substations (132kV to EHV)
- Substations (132kV to HV)
- Substations (EHV to EHV)
- Substations (EHV to HV)
- Interconnected substation groups (with secondary voltage at HV or above).⁵

Reporting timetable

2.18. DNOs are required to provide a Network Outputs Submission for each year of the price control period, which must contain the required information as at 31 March of that year.

2.19. The reporting timetable for Network Outputs (to September 2015) is set out in table 2.3 below.

⁵ For the purposes of the Agreed Network Outputs, DNOs only reported Load Index information for interconnected substation groups where there was expenditure forecast at the group level, but may have opted to provide this information for groups considered to be of relevance to a current or future general reinforcement decision.

Table 2.3: Reporting timetable – Network Outputs

Date	Submission due
7 December 2009	DPCR5 Agreed Network Outputs Submission (as published with Final Proposals)
30 September 2010	Annual Submission ⁶ - (for LI and HI true up only). No additional forecast is required
30 September 2011	Annual Submission
30 September 2012	Mid-Period Review submission
30 September 2013	Annual Submission
tbc	Initial Performance Assessment Submission
30 September 2014	Final Performance Assessment Submission
30 September 2015	Annual Submission ⁷

Material Changes

2.20. It is important that the reasons for changes in the outputs delivered over DPCR5 relative to the Agreed Network Outputs are tracked and well understood through constructive dialogue between the DNOs and Ofgem. There could be a number of legitimate reasons to explain variations in outturn performance which could be considered Material Changes, including:

- Changes to input data
- Changes to the assessment techniques/calculation methodology
- Changes due to external factors
- Changes to DNO asset management strategy and approach, which could include a change in attitude to risk overall, or a shift in priorities from one risk to another as a result of one of the changes identified in the bullets above.⁸

2.21. Information on Material Changes relative to the Agreed Network Outputs is to be reported by DNOs as part of a Network Outputs Submission, and is relevant for

⁶ This submission will provide an actual snapshot as at the start of DPCR5.

⁷ This submission will provide an actual snapshot as at the end of DPCR5 (start of RIIO - ED1), and will be used to 'true-up' the Network Outputs revenue adjustment (if required). See paragraphs 2.122 to 2.124 for details.

⁸ It is recognised that the changes to highlight in the annual submission for years 1 and 2 of DPCR5 will likely focus only on changes to input data or the calculation method.

the purposes of determining the Adjusted Network Outputs. The nature and content of discussions between Ofgem and DNOs on the Material Changes identified and addressed through re-prioritisation is to be recorded in the Material Change Log.

Changes due to input data

2.22. Changes to input data are particularly likely with respect to the Health Index given that most DNOs continue to work towards a full dataset throughout DPCR5. The information provided on changes due to input data must be auditable, and include details of and reasons for, all Material Changes in the DNO's data collection methodology, assumptions, or in the underlying quality of the data set.

2.23. Material Changes in this category may be due (but are not limited) to:

- an exogenous change in data (eg due to a type fault identified)
- unexpected changes in data (eg asset health degradation being better or worse than forecast)
- a conscious business decision regarding the data collection methodology which causes a change in data accuracy for the relevant measure.

2.24. As an example, a change to the equipment rating would constitute a change to input data (along with any consequent change to firm capacity as defined), whereas a change to the DNO's definition of firm capacity would constitute a change to the assessment technique / calculation methodology.

Changes to the assessment technique/calculation methodology

2.25. Changes to the assessment techniques/calculation methodologies applied by the DNOs are possible given that the methodology for Network Outputs is still relatively new. On this basis it is recognised that a DNO's outputs delivered may diverge from the Agreed Network Outputs as new asset information or new and innovative asset management techniques are adopted. The information provided on changes to the assessment techniques used for individual outputs or the calculation and data collection methodologies must be auditable, and include details of, and reasons for, all those changes that produce a different set of outputs for a given set of inputs.

2.26. Material Changes in this category may include (but are not limited to):

- development of innovative (condition) assessment technique for an individual Network Output
- changes to asset degradation assumptions
- change to the definition of firm (n-1) capacity
- introduction of a new or improved Health Index methodology
- a conscious business decision regarding key data requirements, causing a change in the data items used for the output measure
- legitimate changes to data interpretation (eg weightings/thresholds).

Changes due to external factors

2.27. Changes in output delivery may occur due to external factors. The Material Changes in this category may include (but are not limited to):

- exceptional events (eg floods)
- speed of economic recovery (eg load growth different than forecast)
- legislative changes (eg greater focus placed on developing networks for a low carbon future)
- resource constraints (eg availability of human and plant resources in marketplace)
- significant changes in input prices
- planning constraints.

Asset management strategy

2.28. DNOs are expected to continuously optimise their asset risk management and this is likely to cause rebalancing of relative risks to optimise interventions. In doing so DNOs must take into account the change in the level of risk that customers have funded through the price control settlement. The information provided on changes to a DNO's asset management strategy must include details of and reasons for any deliberate decision to alter the relative or aggregate level of network risk faced.

2.29. Material Changes that may drive a need to reprioritise activities could arise for a number of reasons, including (but not limited to) any of those examples discussed above in paragraphs 2.56 to 2.58.

2.30. DNOs may provide information on their asset management approach as part of an Annual Submission however this is not expected to be a focus of discussions with Ofgem until the mid-period review. A full re-forecast of Network Outputs data, taking into account all forecast asset management Interventions, is not required until the mid-period review.

Annual reporting of Network Outputs

2.31. DNOs are required to provide an annual submission for Network Outputs in accordance with the timetable set out in table 2.3 above. The Annual Submission must include data in the reporting workbook for the following:

- Load Index – current LI profile (ie as at 1 April), and updated forecast LI profile without further Intervention (ie as at 31 March 2015)
- Health Index – current HI profile and commentary on HI data quality (ie as at 1 April), and updated forecast HI profile without further Intervention (ie as at 31 March 2015)

- Fault Rate Record – an updated actual Fault Rate for each relevant Fault Rate Asset Category.⁹

2.32. Section 2.125 of this RIG sets out detailed instructions and guidance for completing the reporting workbook.

2.33. In accordance with SLC44A Ofgem may appoint an Examiner to review the accuracy and integrity of the outputs data provided.

2.34. In addition to the information reported in the workbook, as part of the annual submission DNOs are required to provide commentary on all Material Changes that have occurred in the year since the previous submission.

2.35. It is important that the reasons for changes in the outputs delivered during DPCR5 relative to the Agreed Network Outputs are tracked and well understood through constructive dialogue between the DNOs and Ofgem. There could be a number of legitimate reasons to explain variations in outturn performance which could be considered Material Changes, including:

- a) Changes to input data
- b) Changes to the assessment techniques/calculation methodology
- c) Changes due to external factors
- d) Changes to DNO asset management strategy and approach, which could include a change in attitude to risk overall, or a shift in priorities from one risk to another as a result of one of the changes identified in (a), (b), and (c) above.¹⁰

2.36. Details on the nature of these Material Changes are contained in paragraphs 2.54 to 2.61 of this RIG.

2.37. The nature of any discussions between Ofgem and the DNOs with respect to the Material Changes identified and reported in an Annual Submission must be recorded in the Material Change Log.

2.38. The information contained in an Annual Submission will be reviewed by Ofgem and recorded in the Material Change Log. However it should be noted that the contents of the Annual Submission will not be approved by Ofgem in the sense that a formal declaration of the acceptability or otherwise will be issued. Ofgem reserves the right to assess a DNO's performance in delivering its outputs across the full period as part of the end-of-period performance assessment.

⁹ For the avoidance of doubt, an updated 31 March 2015 (with further Intervention) profile for Network Outputs is not required as part of the Annual Submission.

¹⁰ It is recognised that the changes to highlight in the annual submission for years 1 and 2 of DPCR5 will likely focus only on changes to input data or the calculation method.

2.39. It is acknowledged, however, that there is a clearly established intent to work bi-laterally in developing the use of outputs during the DPCR5 period and the inappropriate use of hindsight in judging performance at RIIIO - ED1 is to be avoided. DNOs can expect a substantive discussion with Ofgem following provision of each Annual Submission, during the course of which Ofgem will set out its opinion at that time on the progress being made in the context of the 5 year outcomes being pursued.

Network Outputs mid-period review

2.40. The purpose of the mid-period review is for DNOs to explain their progress towards achieving the Agreed Network Outputs. As part of the mid-period review a DNO must provide an updated forecast of their Network Outputs with further Intervention (ie as at 31 March 2015), which represents the DNO's interim view of the Adjusted Network Outputs. Ofgem will note the data and commentary in the Mid-Period Review Submission for price control discussions, provide guidance to DNOs on their progress and highlight any areas of concern at a high-level.

2.41. In accordance with the timetable set out in table 2.3, DNOs are required to provide a Mid-Period Review Submission by no later than 30 September 2012. The mid-period review is to take place in the period October-December 2012.

2.42. The Mid-Period Review Submission must include a full re-population of the reporting workbook, which comprises the following:

- Load Index – current LI profile (ie as at 31 March 2012), an updated forecast LI profile as at 31 March 2015 without further Intervention, and an updated forecast LI profile as at 31 March 2015 with further Intervention
- Health Index – current HI profile and commentary on HI data quality (ie as at 31 March 2012), an updated forecast HI profile as at 31 March 2015 without further Intervention, and an updated forecast HI profile as at 31 March 2015 with further Intervention
- Fault Rate Record – current fault rate, and an updated forecast Fault Rate for each relevant Fault Rate Asset Category for each year to 31 March 2015.

2.43. Section 2.125 of this RIG sets out detailed instructions and guidance for completing the reporting workbook.

2.44. In accordance with SLC 44A Ofgem may appoint an Examiner to review the accuracy and integrity of the outputs data provided.

2.45. In addition to the information reported in the workbook, as part of the Mid-Period Review Submission DNOs are required to provide commentary on all Material Changes that have occurred in the year since the previous submission, as well as a

recap of previously reported Material Changes. It is expected that the DNO responses to these Material Changes will then be reflected in the updated forecasts.

2.46. There could be a number of reasons to explain variations in outturn performance which could be considered Material Changes, including:

- a) Changes to input data
- b) Changes to the assessment techniques/calculation methodology
- c) Changes due to external factors
- d) Changes to DNO asset management strategy and approach, which could include a change in attitude to risk overall, or a shift in priorities from one risk to another as a result of one of the changes identified in (a), (b) and (c) above.

2.47. The nature of these Material Changes is explained further in paragraph 2.20 of this RIG.

2.48. It is recognised that the Material Changes identified under paragraphs 2.46(a), 2.46(b) and 2.46(c) may directly impact the current profile (ie as at 31 March 2012) and the forecast profile as at 31 March 2015 without further intervention, whereas the DNO's asset management response to these Material Changes (ie paragraph 2.46(d)) will wrap all these changes up to produce a forecast profile as at 31 March 2015 with further Intervention. It is also recognised that Material Changes due to external factors identified under paragraph 2.46(c) may directly impact the forecast profile as at 31 March 2015 with further Intervention.

2.49. As part of the mid-period review, a DNOs must provide a high-level assessment of performance and progress against the Agreed Network Outputs. This assessment must take into account each of the Material Changes identified in paragraph 2.46 above, the impact on the Agreed Network Outputs and the response taken or forecast to be taken. At this time Ofgem may provide specific guidance on those aspects of the submission it considers could be relevant for the purposes of setting the Adjusted Network Outputs as part of the end-of-period performance assessment process, including any specific concerns.

2.50. The nature of any discussions between Ofgem and the DNOs with respect to the Material Changes identified and reported in the Mid-Period Review Submission, including any guidance provided by Ofgem, must be recorded in the Material Change Log. It should be noted however that the information provided by the DNOs as part of the Mid-Period Review Submission will not be approved by Ofgem in the sense that a formal declaration of the acceptability or otherwise of DNO actions will be issued. Ofgem reserve the right to assess a DNO's performance in delivering its outputs across the full period as part of the end-of-period Network Outputs performance assessment.

2.51. The specific timeframes for the provision of RIIO - ED1 Network Outputs information are to be agreed as part of the mid-period review.

Network Outputs performance assessment

2.52. As part of the RIIO - ED1 process Ofgem is to conduct a Network Outputs performance assessment. The purpose of the performance assessment is to determine whether or not a DNO has satisfactorily delivered a package of outputs consistent with the change in the level of risk funded by its customers through the DPCR5 settlement. At a high level, this requires DNOs to provide information to demonstrate that the program of work actually (and forecast to be) delivered over DPCR5 was in customer's best interests, and for Ofgem to qualitatively determine whether or not this is the case. In making this assessment Ofgem accepts that the Delivered Network Outputs will differ from the Agreed Network Outputs in detail due to the impact of Material Changes.

2.53. The specific timetable for provision of the Initial Performance Assessment Submission is to be determined as part of the RIIO - ED1 process. The final Performance Assessment Submission is to be provided by no later than 30 September 2014. The performance assessment is to take place over the course of the RIIO - ED1 review.

2.54. The performance assessment process is summarised as follows:

- As part of its Performance Assessment Submission, a DNO must provide information to demonstrate that the Delivered Network Outputs are in customers' best interests, taking into account all Material Changes that have occurred over the price control period which have impacted outturn delivery relative to the Agreed Network Outputs.
- Based on this information, Ofgem is to qualitatively determine at a high level:
 - the Adjusted Network Outputs
 - whether or not a DNO has met its Adjusted Network Outputs.
- If Ofgem determines that a DNO has not satisfactorily delivered its Adjusted Network Outputs, a financial adjustment is to be applied to RIIO - ED1 revenues, which is to be calculated as follows:
 - Value the difference between the DNO's Delivered Network Outputs and the Adjusted Network Outputs (ie the 'Network Outputs Gap')
 - Apply a sharing factor to the Network Outputs Gap to calculate a revenue adjustment (the 'Network Outputs revenue adjustment').
- In the event that Ofgem applies the Network Outputs revenue adjustment to a DNO's RIIO - ED1 revenues, there may be a requirement for a 'true-up' at the end of the first year of RIIO - ED1, once the final year of Network Outputs data for DPCR5 is received.

2.55. For the avoidance of misunderstanding, allowances for RIIO - ED1 will be based upon the network need at the time and any under-delivery of DPCR5 outputs will be catered for by the revenue adjustment and not by reducing future allowances.

2.56. This section is structured as follows:

- Performance assessment submission
- Qualitative performance assessment process
- Revenue adjustment for failure to deliver Adjusted Network Outputs
- Correction to Network Outputs revenue adjustment during RIIO - ED1.

Performance assessment submission

2.57. The performance assessment submission must include a full re-population of the reporting workbook, which comprises the following:

- Load Index – current LI profile (ie as at 31 March 2014), an updated forecast LI profile as at 31 March 2015 without further intervention and an updated forecast LI profile 31 March 2015 with further intervention
- Health Index – current HI profile and commentary on HI data quality (ie as at 31 March 2014), an updated forecast HI profile 31 March 2015 without further intervention and an updated forecast HI profile 31 March 2015 with further intervention
- Fault Rate Record – current fault rate, and an updated forecast Fault Rate for each relevant Fault Rate Asset Category for each year to 31 March 2015.

2.58. Section 2.125 of this RIG sets out detailed instructions and guidance for completing the reporting workbook.

2.59. In accordance with SLC 44A Ofgem may appoint an Examiner to review the accuracy and integrity of the outputs data provided.

2.60. In addition to the information reported in the workbook, as part of the Performance Assessment Submission DNOs are required to provide commentary on all Material Changes that have impacted performance relative to the Agreed Network Outputs. The commentary provided on Material Changes can cross-reference previous submissions. There could be a number of reasons to explain variations in outturn performance which could be considered Material Changes, including:

- a) Changes to input data
- b) Changes to the assessment techniques/calculation methodology
- c) Changes due to external factors
- d) Changes to DNO asset management strategy and approach, which could include a change in attitude to risk overall, or a shift in priorities from one risk to another as a result of one of the changes identified in (a), (b) and (c) above.

2.61. The nature of these Material Changes is explained further in paragraphs 2.62 to 2.68 of this RIG.

2.62. In their Performance Assessment Submission DNOs are required to provide evidence to demonstrate and explain:

- the nature of all Material Changes identified under paragraphs 2.35(a), 2.35(b) and 2.35(c)
- the impact of these Material Changes on output performance as at 31 March 2014
- the impact of these Material Changes on forecast output performance as at 31 March 2015 before taking into account any further Intervention
- the impact of the asset management decisions taken to address these Material Changes, as well as any other deliberate decisions affecting the level of network risk, on the Delivered Network Outputs, and
- taking into account all this information, the reasons why the Delivered Network Outputs represent the best outcome for customers, and specifically why they represent the Adjusted Network Outputs – by delivering an equivalent change in the level of risk as that implied by the Agreed Network Outputs.

2.63. It is recognised that the Material Changes identified under paragraphs 2.35(a), 2.35(b) and 2.35(c) may directly impact the current profile (ie as at 31 March 2014) and the forecast profile as at 31 March 2015 without further Intervention, whereas the DNO's asset management response to these Material Changes (ie paragraph 2.35(d)) will wrap all these changes up to produce the Delivered Network Outputs. It is also recognised that Material Changes due to external factors identified under paragraph 2.35(c) may directly impact the Delivered Network Outputs.

2.64. As part of the Performance Assessment Submission DNOs must refer to the information previously provided on Material Changes, as contained in the Material Change Log.

2.65. The following examples illustrate the type of changes that could occur over the period, and possible DNO asset management decisions in response:

- During the period a type-specific fault is identified for a particular Distribution Asset Category which impacts HI rankings and causes the DNO to reprioritise asset replacement away from lower (relative) risk Distribution Asset Categories to this higher (relative) risk Distribution Asset Category.
- Higher than expected load growth in a particular part of the network causes the DNO to reprioritise general reinforcement expenditure to this part of the network and away from other parts of the network which experience lower than expected load growth.
- Further work on asset degradation techniques during the period identifies some Distribution Assets as degrading slower than initially forecast, leading to a reprioritisation of asset replacement expenditure away from these lower (relative) risk Distribution Assets.
- A quicker than expected economic recovery leads to higher load growth and significantly higher input prices, causing the DNO to increasingly examine short

term lower cost solutions such as load transfers, demand side management and increased use of life-extending refurbishment.

2.66. Ofgem recognises that while the Tier 2 Network Output Measures developed for asset replacement and general reinforcement provide a good indication of investment priorities, they do not capture all the critical elements of a DNO's investment decision. This is because they are not holistic measures of 'network risk' (ie Tier 1 Network Output Measures) – they are measures of the probability of failure/overload, which do not yet fully incorporate the consequences of failure and other strategic considerations. In the absence of holistic Tier 1 Network Output Measures, the efficient trade-off of Tier 2 Network Output Measures will need to be demonstrated by DNOs (and assessed by Ofgem) qualitatively. While a qualitative assessment is reasonable for DPCR5, we consider that the development of Tier 1 Network Output Measures over time represents a logical evolution of this process, and is in the interests of both parties. Ofgem will work with the DNOs to develop Tier 1 Network Output Measures over the DPCR5 period, by building on or aggregating the site and asset specific Tier 2 Network Output Measures which have been developed for the DPCR5 settlement.¹¹

2.67. It is recognised that a DNO's views on the Adjusted Network Outputs may not perfectly coincide with the Delivered Network Outputs it has reported in its Performance Assessment Submission. Such a divergence may occur as a result of a Material Change due to an external factor. For example, planning constraints may delay projects, which in itself does not change the underlying need for Intervention at these sites, but impacts upon the DNO's ability to meet its Agreed Network Outputs. In this case a DNO may submit that the Adjusted Network Outputs have not been delivered due to circumstances beyond its control.

2.68. There should be few surprises in the performance assessment submission – a consistent story is expected to develop over the period with respect to output performance, based on the information from previous submissions as well as that recorded in the Material Changes Log.

Qualitative performance assessment process

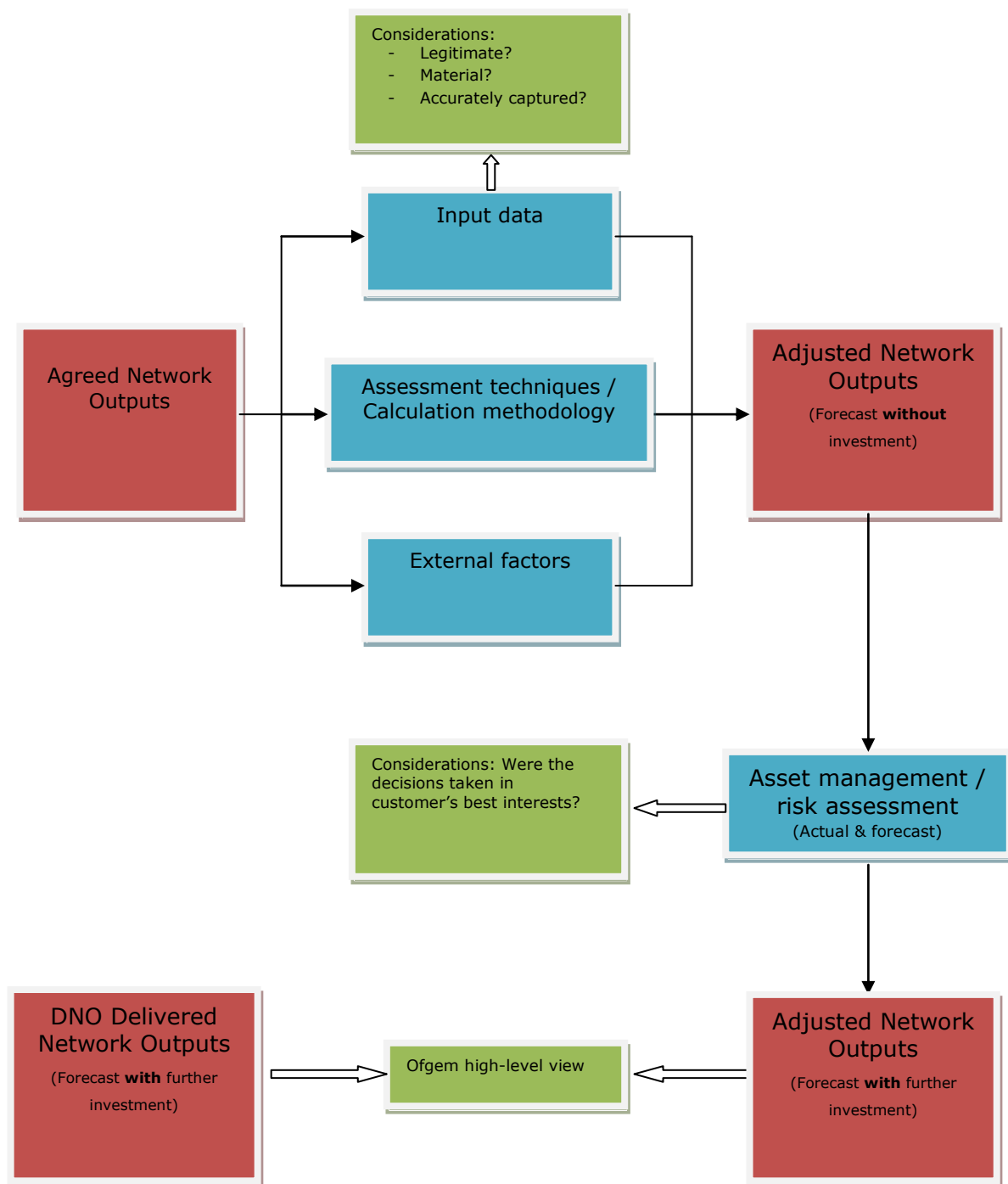
2.69. Based on the information provided by the DNO in its Performance Assessment Submission, Ofgem is to undertake a qualitative assessment to determine:

- the Adjusted Network Outputs
- whether a DNO has met its Adjusted Network Outputs.

¹¹ As an interim step towards development of holistic network-wide risk metrics, DNOs may develop quantitative measures to assess the relative risk between two or more Tier 2 Network Output Measures (referred to here as 'tier 1.5 network output measures').

2.70. This assessment is to be undertaken in a number of distinct steps, as described in figure 2.1 below.

Figure 2.1: Network Outputs qualitative performance assessment process



2.71. Ofgem is to examine the information presented by the DNO in its Performance Assessment Submission on each of the Material Changes identified as being due to:

- Input data
- Assessment techniques/calculation methodology
- External factors.

2.72. Ofgem is to have regard to the information contained in the Material Change Log in undertaking its assessment at paragraph 2.71.

2.73. In doing so, Ofgem is to qualitatively assess the information provided on each of these Material Changes to determine whether:

- the change/event identified is legitimate and did not appear in the forecast
- the change/event has a material impact on the DNO's achievement of the Agreed Network Outputs
- the impact of the change/event has been accurately captured.

2.74. Based on this assessment, Ofgem is to qualitatively determine the Adjusted Network Outputs without further Intervention (ie as at 31 March 2015).

Adjusted Network Outputs

2.75. The Adjusted Network Outputs with further Intervention (ie as at 31 March 2015) are the outputs that a DNO's Delivered Network Outputs are to be assessed against by Ofgem as part of the performance assessment. The Adjusted Network Outputs are the Agreed Network Outputs, adjusted for Ofgem's view of an efficient and reasonable response to all Material Changes that occur over the price control period.

2.76. Ofgem is to assess the efficiency and efficacy of the asset management decisions taken by the DNO in response to the Material Changes identified. In doing so the overriding objective is to ensure that the resulting Adjusted Network Outputs reflect the best network risk outcome for customers given: (a) the impact of all Material Changes; and (b) the change in the level of network risk funded by customers via the DPCR5 settlement.

2.77. Ofgem's assessment is to be informed by, and must be consistent with, its previous discussions with the DNO, as recorded in the Material Change Log.

2.78. Taking this information into account, Ofgem is to qualitatively determine the Adjusted Network Outputs and then qualitatively assess whether or not, at an overall level, the DNO has met its Adjusted Network Outputs.

2.79. Ofgem is to apply the following high-level principles in determining whether or not a DNO has met its Adjusted Network Outputs:

- Efficient reprioritisation of activities is expected and encouraged – the key consideration is the change in the overall level of network risk provided by the DNO's Delivered Network Outputs compared to the change in the level of network risk implicit in the Agreed Network Outputs¹²
- The conclusion is to be a qualitative 'pass/fail' at the overall level, however it is to be informed by the data and commentary provided for the individual Tier 2 Network Output Measures
- There is to be no specific and quantitative thresholds adopted to identify areas for further consideration – the outputs data is intended to be a useful resource to assist DNOs in justifying, and for Ofgem in assessing, the efficiency and efficacy of asset management decisions
- Further improvement and innovation in asset management techniques should be encouraged and not hindered by the performance assessment process
- The efficiency of significant decisions related to the timing of interventions (eg replacement/refurbishment; reinforcement/load transfers) must be justified where appropriate through whole-of-life NPV analysis
- There needs to be significant and material issues identified with the Delivered Network Outputs at the overall level before it can be qualitatively determined that a DNO has not delivered, or is not expected to deliver, the Adjusted Network Outputs.

2.80. If Ofgem qualitatively determines that a DNO has satisfactorily met its Adjusted Network Outputs, there will be no further action under this RIG.

2.81. If Ofgem qualitatively determines that a DNO has not satisfactorily met its Adjusted Network Outputs, a revenue adjustment is to apply (see below).

Revenue adjustment for failure to deliver Adjusted Network Outputs

2.82. If Ofgem qualitatively determines that a DNO has not satisfactorily met its Adjusted Network Outputs, an adjustment is to be applied to RIIO - ED1 revenues. The revenue adjustment is to be calculated as follows:

- Value the difference between the DNO's Delivered Network Outputs and the Adjusted Network Outputs (ie the 'Network Outputs Gap')

¹² This highlights the need for development of Tier 1 Network Output Measures over DPCR5, which will better allow DNOs to make the case that their asset management decisions represent the best outcome for customers.

- Apply a sharing factor to the Network Outputs Gap to calculate a revenue adjustment (the 'Network Outputs revenue adjustment').

Network Outputs Gap

2.83. On a line-by-line basis, Ofgem is to calculate the difference in volumes implicit in the DNO's Delivered Network Outputs with the volumes implicit in the Adjusted Network Outputs. For the HI this is to be in terms of the number of assets replaced for each Health Index Asset Category, and for the LI this is to be in terms of the Distribution Asset volumes delivered by the general reinforcement schemes carried out. In determining the volume gap on a line-by-line basis, Ofgem is to remove the impact of any volumes implicit in the DNO's Delivered Network Outputs that are deemed to be unjustified based on network need.

2.84. Then, for the volumes calculated at paragraph 2.83, Ofgem is to determine the appropriate unit cost assumption to apply (ie £/Distribution Asset Category), which is to be the higher of:

- The DNO's outturn unit costs
- Ofgem's forecast unit costs (underpinning the DPCR5 allowance) adjusted for outturn RPI.¹³

2.85. To calculate the Network Outputs Gap, Ofgem is to take the sum of the volume differences in paragraph 2.83 multiplied by the relevant unit costs assumption determined in paragraph 2.84.

Network Outputs revenue adjustment

2.86. The Network Outputs revenue adjustment is equal to the value of the Network Outputs Gap multiplied by the Network Outputs incentive rate, which for DPCR5 is the IQI incentive rate multiplied by a factor of 1.025. The DPCR5 Network Outputs incentive rate is set out for each DNO in table 2.4 below.

¹³ A reasonable unit cost timing assumption to apply is to take an average over the price control period. Where feasible, Ofgem is to value the gap for general reinforcement on a scheme-by-scheme basis, based on forecast and actual scheme costs.

Table 2.4: DPCR5 Network Outputs incentive rate – by DNO

DNO	Network Outputs incentive rate
CN West	48%
CN East	48%
ENWL	46%
CE NEDL	49%
CE YEDL	49%
WPD S Wales	52%
WPD S West	52%
UKPN LPN	46%
UKPN SPN	46%
UKPN EPN	46%
SP Distribution	46%
SP Manweb	46%
SSE Hydro	50%
SSE Southern	50%

2.87. The Network Outputs revenue adjustment is to be applied as part of the final settlement for RIIO - ED1.

Correction to Network Outputs revenue adjustment during RIIO – ED1

2.88. The Performance Assessment Submission contains Year 4 actual data, and a 31 March 2015 forecast, which means that Ofgem in practice is required to determine the Adjusted Network Outputs on the basis of a one-year forecast.

2.89. Therefore Ofgem is to apply a correction to the Network Outputs revenue adjustment based on the information provided by the DNO in its final Annual Submission for DPCR5 (on 30 September 2015). The correction is to be calculated using the same methodology as described in paragraphs 2.83 to 2.86.

2.90. The correction is to be applied as a revenue adjustment with effect from 1 April 2016.

Instructions and guidance for completing Network Outputs reporting workbook

2.91. This section provides guidance for completing the Network Outputs reporting workbook and may need to be updated for future versions of the workbook.

2.92. The Network Output reporting workbook is produced in Microsoft Excel (2003). It includes the following sheets:

- Version & Contents
- LI logic
- LI data
- LI charts
- HI data
- HI charts
- Fault rate data
- MTP all incidents
- MTP one-off ee's only
- MTP severe weather ee's only
- MTP excluding all ee's
- Fault rate charts
- Volume reconciliation.

LI sheets

2.93. These sheets capture and display Load Index (LI) data. The LI is a Tier 2 network output measure related to network utilisation. It is a framework for collating information on the utilisation of the Distributed Assets supplying each Demand Group and for tracking changes in their utilisation over time.

2.94. The LI will be used to inform an assessment of the efficacy of the DNO's general reinforcement decisions over the price control period.

HI sheets

2.95. These sheets capture and display Health Index (HI) data. The Health Index is a Tier 2 network output measure related to asset condition. It is a framework for collating information on the health (or condition) of Distribution Assets and for tracking changes in their condition over time.

2.96. The HI will be used to inform an assessment of the efficacy of the DNOs' asset management decisions over the price control period.

Fault rate and MTP sheets

2.97. These sheets capture and display fault rate data. The MTP sheets capture the number of recorded incidents for asset categories. This data will be used in conjunction with the A1 Total sheet to provide fault rates for each asset category.

Volume reconciliation sheet

2.98. The volume reconciliation sheet provides details of the mapping process from Distribution Asset Categories to Health Index Asset Categories and Fault Rate Asset Categories. This sheet is for reference only.

Version and Contents

2.99. This sheet provides a version history for each Network Outputs Submission, as well as links to each of the other outputs worksheets.

2.100. In the yellow input cells provided, DNOs are required to enter:

- the DNO name to which the submission applies (cell B7)
- the submission number (column B, rows 12-19)
- for each submission, the date submitted (column C, rows 12-19)
- for each submission, the changes made from the previous submission (column D, rows 13-19).

LI logic

2.101. This sheet provides for input of the individual DNO's Load Index Logic (ie decision criteria) for assigning Demand Groups a Load Index ranking LI1 to LI5, in accordance with the high-level common definitions contained at paragraph 2.33 of this RIG. The allocation is dependent on the individual DNO's views regarding the level of and interaction between the following drivers for a site-specific demand-related Intervention:

- Demand driver: measure of the maximum demand of the Demand Group relative to the firm (n-1) capacity of the Demand Group
- Duration driver: measure of the hours/energy at risk per annum brought about by the capacity utilisation for the Demand Group.

Description of Logic

2.102. In the 'Description of Logic' section, enter the maximum demand as a percentage of the firm capacity applicable to each ranking LI1 to LI5 (column C, rows 8-32); and the number of hours or MVA at risk applicable to each ranking LI1 to LI5 (column D, rows 8-32). For example, in table 2.5 below the DNO has defined 'LI5' as a Demand Group with either:

- Maximum demand as a percentage of firm capacity of 100-110% and >200 hours at risk per annum, or
- Maximum demand as a percentage of firm capacity of greater than 110%.

Table 2.5: LI logic sheet – Description of logic (example)

	B	C	D
7		Demand driver	Duration driver
8	LI1	0-60%	
9			
10			
11			
12			
13	LI2	60-80%	
14			
15			
16			
17			
18	LI3	80-100%	
19			
20			
21			
22			
23	LI4	100-110%	0-200 hours
24			
25			
26			
27			
28	LI5	100-110%	>200 hours
29		>110%	
30			
31			
32			

Logic Thresholds

2.103. In the 'Logic Thresholds' section, enter the lower and upper bounds of each threshold for the 'Demand driver' (columns G-H, rows 8-12) and the 'Duration driver' (columns G-H, rows 13-16). An example is provided in table 2.6 below, which contains the same logic as in table 2.5.

Table 2.6: LI logic sheet – Logic Thresholds (example)

	F	G	H
7		Lower bound	Upper bound
8	Demand driver	0.00	0.60
9		0.60	0.80
10		0.80	1.00
11		1.00	1.10
12		1.10	
13	Duration driver	0	200
14		200	
15			
16			

Logic VLOOKUP Tables

2.104. The DNO-specific data to be entered in the 'Logic VLOOKUP Tables' section must be entered in consultation with Ofgem. Broadly, in the 'Demand driver' table (column G, rows 21-24), DNOs need to enter the rankings "LI1" to "LI5" applicable to each threshold for the 'Demand driver'. These values need to be entered in the cells adjacent and directly to the right of the lower bound thresholds (ie column F, rows 21-24). For LI rankings in which both drivers operate, DNOs need to enter "Duration" in the relevant cells of the 'Demand driver' table (column G, rows 21-24). Then, in the 'Duration driver' table (column G, rows 27-29), DNOs need to enter the rankings "LI1" to "LI5" applicable to each threshold for the 'Duration driver'.

2.105. For example, in table 2.7 below, for a Demand group with maximum demand as a percentage of firm capacity of 100-110%, the DNO has entered "Duration" in cell G24, which triggers the 'Duration driver'. The values entered by the DNO in the 'Duration driver' table for this example indicate that:

- A Demand Group is defined as "LI4" if maximum demand as a percentage of firm capacity is between 100-110%, and there are 0-200 hours at risk per annum (cell G28)
- A Demand Group is defined as "LI5" if maximum demand as a percentage of firm capacity is between 100-110%, and there are greater than 200 hours at risk per annum (cell G29).

Table 2.7: LI logic sheet – Logic VLOOKUP Tables (example)

	F	G
19		
20	Demand	
21	0.00	LI1
22	0.60	LI2
23	0.80	LI3
24	1.00	Duration
25	1.10	LI5
26		
27	Duration	
28	0	LI4
29	200	LI5
30		

LI data

2.106. The LI data sheet contains the full set of input data used to generate the LI profile for each Demand Group, and is split into two sections:

- Individual substations (rows 6-812)
- Substation groups (rows 816-1222).

2.107. The following section explains the requirements for data to be entered into the relevant yellow input cells, for each of the columns of the LI data sheet. As explained in Table 2.3 of this RIG, there are different reporting requirements at different points in time over the price control period. For the LI data sheet:

- All the relevant yellow input cells will have been populated for the purposes of defining the Agreed Network Outputs (ie the baseline)
- For an Annual Submission, all yellow input cells except those in columns Z to AI must be populated
- All the relevant yellow input cells must be populated for the purposes of the Mid-Period Review Submission and the Performance Assessment Submission.

*Demand Group description
Substation name (column C)*

2.108. Please enter the name of the substation, where possible by reference to its geographic location. For interconnected substation groups (rows 816-1222), in column C, please enter a name for the group and the names of the individual substations which make up the group.

Category (column D)

2.109. Please enter the primary and secondary voltage levels supplying each Demand Group, as follows:

- 132kV – EHV
- 132kV – HV
- EHV – EHV or
- EHV – HV.

No. of customers (column E)

2.110. For each Demand group, please enter the number of customers supplied. In addition, please manually enter the total number of customers supplied in the DNO region at cell E811 and cell E1221.

Percentage of customers supplied by substation (column F)

2.111. This column automatically calculates the number of customers for each Demand group as a percentage of the total number of customers. Note that the total number of customers supplied by all substations will exceed the total number of customers supplied by the network (ie the value in cell F811 exceeds 100%), given that any individual customer may be supplied by more than one substation, at different voltages.

Load Index – Current (as at 31 March)

Current substation firm capacity under single circuit outage conditions (column G)

2.112. For each Demand Group, please enter the firm (n-1) capacity in MVA units as at 31 March of the current year. The data in this column provides a snapshot of the actual firm capacity for each Demand Group.

Season of Most Onerous Demand and Limiting Factor (column H)

2.113. Please provide the season of most onerous demand for each Demand Group. In addition please provide the limiting factor relevant to each Demand Group, classified as one of the following:

- Cyclic rating of a transformer
- Rating of the incoming circuit(s)
- Capacity of normally connected secondary interconnection
- Rating of the secondary switchboard
- Rating of any ancillary equipment
- Voltage regulation
- Substation or network configuration
- Rating of the primary switchgear or busbars
- Redundant substation
- Meshed network circuit capacity
- Customer connection agreement

Substation current Maximum Demand (column I)

2.114. For each Demand Group, please enter the maximum MVA demand for the year ending 31 March of the current year. The data in this column provides a snapshot of the actual maximum demand for each Demand Group.

Substation current maximum demand as % of Substation firm capacity (column J)

2.115. This column automatically calculates, for each Demand Group, the current maximum demand as a percentage of firm capacity. This constitutes the 'Demand driver' for each Demand Group as at 31 March of the current year.

Current hours / energy at risk (column K)

2.116. Please indicate in the tick-box provided (cell K8) whether the 'Duration driver' is based on a measure of "Duration" or "MVAh", and correspondingly in cell K9. Then, for each Demand Group, in column K please enter the current hours / MVAh at risk (if any). The data in this column constitutes the 'Duration driver' for each Demand Group for the year ending 31 March of the current year.

Load index ranking (column L)

2.117. This column takes the current 'Demand driver' (column J) and the 'Duration driver' (column K) and assigns a Load Index ranking LI1 to LI5 using the decision criteria contained in the VLOOKUP tables in the LI logic sheet. This provides a snapshot of the LI ranking as at 31 March of the current year.

Forecast load information

Historic and forecast max demand – excluding forecast Intervention (columns M to V)

2.118. For each Demand Group, please enter the actual and forecast maximum demand (MVA) over the 10 year period specified, excluding the impact of any forecast Intervention.

Load index – 31 March 2015 (with no further DPCR5 Intervention)

31 March 2015 Substation Maximum Demand as % of Substation firm capacity – with no further DPCR5 Intervention (column W)

2.119. This column automatically calculates, for each Demand Group, maximum demand forecast as at 31 March 2015 (column V) as a percentage of current firm capacity. This constitutes the 'Demand driver' for each Demand Group as at 31 March 2015 with no further DPCR5 Intervention.

31 March 2015 forecast energy / hours at risk – with no further DPCR5 Intervention (column X)

2.120. For each Demand Group, in column X please enter the forecast hours/MVAh at risk (if any), as at 31 March 2015, assuming no further DPCR5 intervention. The data in this column constitutes the 'Duration driver' for each Demand Group as at 31 March 2015 with no further DPCR5 Intervention.

Load index ranking (column Y)

2.121. This column takes the 'Demand driver' (column W) and the 'Duration driver' (column X) as at 31 March 2015 with no further DPCR5 Intervention, and assigns a Load Index ranking LI1 to LI5 using the decision criteria contained in the VLOOKUP tables in the LI logic sheet. This provides a forecast of the LI ranking as at 31 March 2015 with no further DPCR5 Intervention.

Load index – 31 March 2015 (with further DPCR5 Intervention)

Is there expenditure contained within the FBPQ relating to a general reinforcement scheme which will increase firm capacity for this demand group over DPCR5? (column Z)

2.122. Each DNO will have populated this column (ie "Yes"/"No") as part of providing its Agreed Network Outputs at the start of the price control period. As part of the DPCR5 process, the data provided by DNOs in column Z was used to reconcile the LI data with the general reinforcement schemes listed in Table LR4 of the FBPQ – to ensure that the Agreed Network Outputs reconciled with the revenue allowance for general reinforcement. The data in this column will be locked for the duration of the price control period.

2.123. While it is recognised that the outcome of a general reinforcement scheme may constitute more than an increase to firm capacity for a Demand Group (ie it may also include permanent load transfers), this column seeks only to identify those Demand Groups where there is an increase in capacity planned. See paragraph 2.81 below for reporting of changes to maximum demand as a result of permanent load transfers.

Is a reinforcement to increase firm capacity for this demand group underway or planned over DPCR5 (ie after reprioritisation)? (column AA)

2.124. As part of the mid-period review submission and the performance assessment submission, DNOs must enter "Yes" or "No" in column AA. This must provide the DNO's updated best view of the reinforcement work undertaken or planned over DPCR5.

31 March 2015 Substation firm capacity under single circuit outage conditions – with further DPCR5 Intervention (column AB)

2.125. As part of the Mid-Period Review Submission and the Performance Assessment Submission, for each Demand Group please enter the forecast firm (n-1) capacity in MVA units as at 31 March 2015 with further DPCR5 Intervention. The data in this column provides an update of the forecast capacity for each Demand Group, and is relevant to the setting of the Adjusted Network Outputs.

31 March 2015 Substation Maximum Demand after permanent load transfers (column AC)

2.126. As part of the Mid-Period Review Submission and the Performance Assessment Submission, for each Demand Group please enter the forecast maximum demand in MVA units as at 31 March 2015, after accounting for expected permanent load transfers (if any).

31 March 2015 substation current maximum demand as % of Substation firm capacity – with further DPCR5 Intervention (column AD)

2.127. This column will automatically calculate, for each Demand Group, the forecast of maximum demand as a percentage of firm capacity as at 31 March 2015 after permanent load transfers (column AC) (with further DPCR5 Intervention). This constitutes the 'Demand driver' for each Demand Group as at 31 March 2015 (with further DPCR5 Intervention), and is relevant to the setting of the Adjusted Network Outputs.

31 March 2015 forecast energy / hours at risk – with further DPCR Intervention (column AE)

2.128. As part of the Mid-Period Review Submission and the Performance Assessment Submission, for each Demand Group, in column AE please enter the forecast hours/MVAh at risk (if any) as at 31 March 2015, after accounting for further forecast DPCR5 Intervention. The data in this column constitutes the 'Duration driver' for each Demand Group as at 31 March 2015 (with further DPCR5 Intervention), and is relevant to the setting of the Adjusted Network Outputs.

Load index ranking (column AF)

2.129. This column takes the 'Demand driver' (column AD) and the 'Duration driver' (column AE) as at 31 March 2015 with further DPCR5 Intervention, and assigns a Load Index ranking LI1 to LI5 using the decision criteria contained in the VLOOKUP tables in the LI logic sheet. This provides a forecast of the LI ranking as at 31 March 2015 with further DPCR5 intervention, and is relevant to the setting of the Adjusted Network Outputs.

For those demand groups in which a reinforcement to increase firm capacity is underway or planned over DPCR5, please indicate the demand driver for the project (column AG)

2.130. As part of the Mid-Period Review Submission and the Performance Assessment Submission, in this column DNOs are required to enter "Organic load growth" or "One-off customer connection" for each Demand group in which "Yes" is entered in column AA (see paragraph 2.79 above). The information in this column may be used to inform discussions during the price control period on a DNO's structure of charges.

Risk Management

Risk management/operational measures in places as at 31 March 2015 – may include manual transfers in operation or planned, DG, DSR, etc. (column AH)

2.131. As part of the Mid-Period Review Submission and the Performance Assessment Submission, in this column DNOs will be provided the opportunity to enter commentary on any operational or risk management measures forecast to be in place (as at 31 March 2015) which are relevant for the Demand Group. Commentary in column AH may also relate to expected developments for which it is not possible to accurately forecast the impact on either capacity or demand (eg Distributed Generation, demand-side management activities).

2.132. It is recognised that although such measures will not have a permanent impact on either the firm (n-1) capacity or the maximum demand for the Demand Group (or this impact cannot be reliably estimated), they represent common asset management practices and may have a material impact on the decision on whether or not to undertake investment.¹⁴

P2/6 Compliance

Is a derogation or self-derogation against P2/6 in place, or planned? (column AI)

2.133. As part of the Mid-Period Review Submission and the Performance Assessment Submission, in this column DNOs must indicate whether there is a derogation against P2/6 in place or planned for the Demand Group. This provides an

¹⁴ Over the course of DPCR5, Ofgem is to work with the DNOs to explore how such measures and developments can be more fully integrated into the common methodology.

opportunity to highlight compliance issues that may impact the decision to undertake (and the timing for) investment.¹⁵

Changes to firm capacity from previous year

Previous year substation firm capacity – as at 31 March (column AK)

2.134. For each Demand Group, please enter the firm (n-1) capacity as at 31 March of the previous year, as presented in the previous year's submission.

Previous year substation firm capacity (as at 31 March) - after accounting for Material Changes (column AL)

2.135. For each Demand Group, please enter the firm (n-1) capacity as at 31 March of the previous year, adjusted for any Material Changes that occurred in the year since the previous submission.

Current substation firm capacity under single circuit outage conditions - as at 31 March (column AM)

2.136. This column provides the current firm capacity for each Demand Group as at 31 March, taken from column G.

Change in substation firm capacity from previous year due to Material Changes (column AN)

2.137. This column automatically calculates, for each Demand Group, the changes to firm capacity as a result of Material Changes that have occurred since the previous submission.

Change in substation firm capacity from previous year due to Intervention (column AO)

2.138. This column automatically calculates, for each Demand Group, the changes to firm capacity as a result of Interventions that have occurred since the previous submission.

¹⁵ Over the course of DPCR5, Ofgem would like to work with the DNOs to more fully integrate P2/6 compliance issues into the common methodology.

Briefly explain the nature/category of any Material Change affecting Firm Capacity for this Demand Group (column AP)

2.139. For each Demand Group, please provide a brief explanatory note for the Material Changes to firm capacity that have occurred since the previous submission (as calculated in column AN). Please provide details of the nature and impact of Material Changes (at an overall level) in the commentary accompanying the submission.

Forecast of current substation maximum demand from previous year (column AQ)

2.140. For each Demand Group, please enter the forecast of current maximum demand from the previous year's submission.

Current substation maximum demand - after accounting for Material Changes (column AR)

2.141. For each Demand Group, please enter the forecast of current maximum demand from the previous year's submission, adjusted for any Material Changes that occurred in the year since the previous submission.

Substation current maximum demand (column AS)

2.142. This column provides the current maximum demand for each Demand Group as at 31 March, taken from column I.

Change in substation maximum demand from previous year due to Material Changes (column AT)

2.143. This column automatically calculates, for each Demand Group, the changes to maximum demand as a result of Material Changes that have occurred since the previous submission.

Change in substation maximum demand from previous year due to Intervention – eg permanent load transfers, DSR, DG (column AU)

2.144. This column automatically calculates, for each Demand Group, the changes to maximum demand as a result of Interventions that have occurred since the previous submission.

Briefly explain the nature/category of any Material Change affecting maximum demand for this Demand Group (column AV)

2.145. For each Demand Group, please provide a brief explanatory note for the Material Changes to maximum demand that have occurred since the previous

submission (as calculated in column AT). Commentary in this column needs only to be provided by exception (eg for once-off changes to demand). Please provide details of the nature and impact of Material Changes (at an overall level) in the commentary accompanying the submission.

Hours/energy at risk from previous year (column AW)

2.146. For each Demand Group, please enter the hours/energy at risk as at 31 March of the previous year, as presented in the previous year's submission.

Current hours/energy at risk (column AX)

2.147. This column provides the current hours/energy at risk for each Demand Group as at 31 March, taken from column K.

Change in hours/energy at risk from previous year due to Material Changes (column AY)

2.148. For each Demand Group, please enter the change in hours/energy at risk from the previous year's submission due to any Material Changes that occurred in the year since the previous submission.

Briefly explain the nature/category of any Material Change affecting hours / energy at risk for this Demand Group (column AZ)

2.149. For each Demand Group, please provide a brief explanatory note for the Material Changes to hours/energy at risk that have occurred since the previous submission (as presented in column AY). Please provide details of the nature and impact of Material Changes (at an overall level) in the commentary accompanying the submission.

LI charts

2.150. The LI charts sheet presents the Load Index Network Outputs. This sheet contains a series of buttons which when pressed produce charts from the LI data sheet, for each of the following:

- All substations
- Substations (132kV primary to EHV secondary)
- Substations (EHV primary and secondary)
- Substations (EHV primary to HV secondary)
- Substations (132kV primary to HV secondary)
- Substation groups.

2.151. Each of the charts displays the following:

- Current Load Index profile
- 31 March 2015 Load Index profile (with no DPCR5 Intervention)
- 31 March 2015 Load Index profile (with DPCR5 Intervention).

2.152. At the start of the price control period, each DNO will have provided the three Load Index profiles referred to above, with the 31 March 2015 (with DPCR5 Intervention) LI profile representing the Agreed Network Output for the Load Index.

HI data

2.153. The HI data sheet contains the full set of input data used to generate the HI profile for each Health Index Asset Category, as well as important information on HI data source and quality.

2.154. The following section explains the requirements for data to be entered into the relevant yellow input cells, for each of the columns of the HI data sheet. As explained in Table 2.3 of this RIG, there are different reporting requirements at different points in time over the price control period. For the HI data sheet:

- All the relevant yellow input cells will have been populated for the purposes of defining the Agreed Network Outputs
- For the purposes of annual reporting, only columns C, E to N and U to Y need to be populated (ie columns D and O to S are not required)
- All the relevant yellow input cells must be populated for the purposes of the Mid-Period Review Submission and the Performance Assessment Submission.

Asset register

Current – as at 31 March (column C)

2.155. In this column, for each Health Index Asset Category DNOs must enter the asset volumes contained in the asset register as at 31 March of the current year. For each Health Index Asset Category these volumes must reconcile with the asset volumes for the corresponding Distribution Asset Categories (see paragraph 2.14).

Forecast – as at 31 March 2015 (column D)

2.156. As part of the Mid-Period Review Submission and the Performance Assessment Submission, in this column DNOs must enter the forecast asset volumes for each Health Index Asset Category as 31 March 2015 (ie end of DPCR5).

Health Index – Current (as at 31 March)

HI 1 to HI 5 (columns E to I)

2.157. For each relevant Health Index Asset Category, please enter the number of assets/kms of line that are ranked HI 1 to HI 5 as at 31 March of the current year. While these allocations are to be based on the DNO's internal asset management practices, they must be made in accordance with the agreed common HI definitions contained in table 2.1 of this RIG.

Health Index – 31 March 2015 (with no further DPCR5 Intervention)

HI 1 to HI 5 (columns J to N)

2.158. For each relevant Health Index Asset Category please enter the number of assets / kms of line that are forecast to be ranked HI 1 to HI 5 as at 31 March 2015 (with no further DPCR5 Intervention). While these allocations are to be based on the DNO's internal asset management practices, they must be made in accordance with the agreed common HI definitions contained in table 2.1 of this RIG.

This provides a forecast of the HI ranking as at the end of DPCR5 with no further Intervention, which is effectively an indication of the impact of forecast degradation and routine (non life-extending) maintenance for each Health Index Asset Category.

Health Index – 31 March 2015 (with DPCR5 actual and forecast Intervention)

HI 1 to HI 5 (columns O to S)

2.159. As part of the Mid-Period Review Submission and the Performance Assessment Submission, for each relevant Health Index Asset Category please enter the number of assets / kms of line that are forecast to be ranked HI 1 to HI 5 as at 31 March 2015 (with actual and forecast DPCR5 Intervention). While these allocations are to be based upon the DNO's internal asset management practices, they must be made in accordance with the agreed common HI definitions contained in table 2.1 of this RIG.

2.160. This provides a forecast of the HI ranking as at the end of DPCR5 after taking into account actual and forecast Intervention, which when compared with the updated HI profile as at 31 March 2015 without DPCR5 Intervention, provides an indication of the impact of actual and forecast DNO asset replacement and (life-extending) refurbishment on the HI ranking for each Health Index Asset Category.

Data Quality – Current (as at 31 March)

Number of assets included for HI asset category (column T)

2.161. This column automatically calculates, for each Health Index Asset Category, the total number of assets/kms of line that have been assigned a HI ranking as at

the current date (ie sum of values in columns E to I). Unless otherwise agreed, the values in this column must reconcile with the asset register volumes entered at column C.

Primary form of measure (column U)

2.162. In this column, for each Health Index Asset Category please enter the primary form of measure currently used internally by the DNO assign HI rankings. Please enter one of the following:

- Health
- Condition
- Age or
- Other.

2.163. It is recognised that the data in column U may change over time as DNOs further develop their internal Health Index capabilities.

Percentage of assets actually observed (column V)

2.164. In this column, for each Health Index Asset Category, please enter the proportion of the total asset volumes (ie column T) for which the current HI ranking is based upon an actual observation. This data provides an indication of the extent of sampling undertaken by the DNO to assign HI rankings to their assets.

Average age of data used (column W)

2.165. In this column, for each Health Index Asset Category please enter the average age (in years) of the data underlying the HI rankings. For example, if the data for a particular Health Index Asset Category is collected over a 10 year cycle, a value of "5" must be entered for that category in column W. This data provides an indication of:

- the extent to which the HI data incorporates the latest information
- the frequency with which the HI data is updated by the DNO.

Description of the form of measure used to assign a HI, the quality of data used, and any other relevant information (column X)

2.166. In this column, for each Health Index Asset Category DNOs may enter commentary to describe in more detail the quality of the current HI data. It is expected that the commentary entered in column X will build upon the data entered in columns U to W.

Degradation assumption adopted (column Y)

2.167. In this column, for each Health Index Asset Category please describe the assumptions currently adopted to forecast degradation out to the end of the period. It is recognised that DNOs' degradation assumptions may change over time as internal Health Index capabilities are further developed and improved.

HI charts

2.168. The HI charts sheet presents the Health Index Network Outputs. This sheet contains a series of buttons which when pressed produce charts from the HI data sheet for each of the 23 Health Index Asset Categories.

2.169. For each of the Health Index Asset Categories, the charts display the following:

- Current Health Index profile
- 31 March 2015 Health Index profile (with no DPCR5 Intervention)
- 31 March 2015 Health Index profile (with DPCR5 Intervention).

2.170. At the start of the price control period, each DNO will have provided the three Health Index profiles referred to above, with the HI profile as at 31 March 2015 (with DPCR5 Intervention) representing the Agreed Network Output for the Health Index.

Medium-term performance (MTP)

2.171. Section 4 of the Cost and Revenue Reporting Regulatory Instructions and Guidance sets out definitions and related instructions and guidance for reporting the information that Ofgem requires for monitoring the medium-term performance of distribution networks. Ofgem intends to collect information on the incidents and causes of failures on electric lines and electrical plant. At future price control reviews Ofgem, will want to understand the impact of future expenditure (both capital and operational) on MTP related investments. To avoid duplication, actual fault rate record data will be populated by Ofgem using data provided in the relevant Cost, Volumes and Revenue reporting templates.

2.172. There are four worksheets which show MTP information:

- MTP all incidents.
- MTP one-off ee's only - containing only those incidents which are attributable to one-off exceptional events for which exemptions have been requested and which meet the criteria set out in CRC8 of the distribution licence.
- MTP severe weather ee's only - containing only those incidents which are attributable to severe weather exceptional events for which exemptions have been requested and which meet the criteria set out in CRC8 of the distribution licence.

- MTP excluding all ee's – This sheet is calculated by deducting MTP one-off ee's and MTP severe weather ee's from MTP all incidents.

Fault rate data

2.173. The Fault Rate data sheet contains the full set of input data used to generate the Fault Rate Record for each relevant Fault Rate Asset Category. The volumes for these unplanned incidents are contained in the MTP worksheets, here they are captured in the following categories:

- Damage fault rates – all incidents (rows 91 to 130)
- Damage fault rates – excluding exceptional events (rows 131 to 169).

2.174. The Agreed Network Output is the forecast for 'Damage fault rates - all incidents'.

2.175. As outlined in table 2.3 of this RIG, there are different reporting requirements at different points in time over the price control period. For the Fault Rate data:

- All the relevant yellow input cells will have been populated for the purposes of defining the Agreed Network Outputs
- For the purposes of annual reporting, actual fault rate record data will be populated by Ofgem using data provided in the relevant Cost, Volumes and Revenue reporting templates.
- All the relevant yellow input cells must be populated for the purposes of the Mid-Period Review Submission and the Performance Assessment Submission.

Fault rate charts

2.176. The Fault Rate charts sheet presents the Fault Rate Record for each Fault Rate Asset Category. This sheet contains a series of buttons which, when pressed, produce charts from the Fault Rate data sheet, for each of the 14 Fault Rate Asset Categories. For each of the Fault Rate Asset Categories, the charts display the following:

- Damage fault rates – all incidents (actual)
- Damage fault rates – excluding exceptional events (actual)
- Damage fault rates – all incidents (forecast) and
- Damage fault rates – excluding exceptional events (forecast).

2.177. As part of the Mid-Period Review and Performance Assessment, Ofgem is to compare forecast Fault Rates (ie the Agreed Network Output) with the actual Fault Rates recorded over the period.

Volume reconciliation

2.178. The volume reconciliation sheet provides details of the mapping process from Distribution Asset Categories to Health Index Asset Categories and Fault Rate Asset Categories, consistent with paragraphs 2.14 and 2.15 of this RIG. There is no requirement to enter data in this sheet – it is provided for reference only.

HI tracking

2.179. The HI tracking sheet breaks down, for each Health Index Asset Category, the changes to the HI profile over DPCR5. A DNO must provide an updated HI tracking sheet each year which reconciles to the HI data sheet. The section below provides guidance for a number of specific line items required in this sheet.

Impact on volumes of data cleansing (before Material Changes)

2.180. In this row, please enter the changes from the previous year's HI profile due to data cleansing.¹⁶ The impact of these changes must be entered relative to the previous year's HI profile, before accounting for any Material Changes.

Impact of deterioration (before Material Changes)

2.181. In this row, please enter the impact on the HI profile of deterioration from the previous year's submission. This must reflect the normal path of deterioration assumed as at the previous submission, before accounting for any Material Changes that have occurred during the year (eg change to degradation assumptions).

Variance due to Material Changes

2.182. In this row, please enter the overall impact on the HI profile of all Material Changes impacting that Health Index Asset Category. Details on the nature and impact of Material Changes must be contained in commentary accompanying the submission.

Asset register movements for asset replacement

¹⁶ Data cleansing is defined as the act of detecting and correcting (or removing) corrupt or inaccurate records from the HI data set.

2.183. In this row, please enter the changes to the HI profile resulting from any asset replacement Interventions that have occurred during the year. These numbers will reconcile with relevant volumes in the Asset Register.

Asset register movements for other investment

2.184. In this row please enter the changes to the HI profile that reflect any other investment not captured under asset replacement (eg load-related).

3. Instructions for completing quality of service outputs reporting

QoS Interruptions

Introduction

3.1. The purpose of this chapter is to provide instructions and guidance for quality of service outputs reporting.

3.2. This chapter sets out definitions and related instructions and guidance for the reporting of:

- the number of customers interrupted (CIs)
- the duration of interruptions to supply (CMLs)
- the number of customers interrupted by short interruptions (SIs)
- the number of customers re-interrupted (RIs)
- the number of non quality of service occurrences.

3.3. The quality of service tables are designed to monitor DNO performance against compliance with the interruptions incentive scheme (IIS) and to provide the underlying data to assist with target setting as part of RIIO - ED1.

Information sources

3.4. Most DNOs use the National Fault and Interruption Reporting Scheme (NaFIRS) which is administered by the Energy Networks Association (ENA) - or an equivalent system - to collect information on the number of customers interrupted and duration of interruptions to supply. For the purpose of reporting under SLC 45, DNOs are instructed to use the definitions contained in this guidance.

Definitions of output measures

3.5. Definitions to be applied for reporting on the number of customers interrupted and duration of interruptions to supply, the number of customers interrupted by short interruptions and the number of customers re-interrupted are shown below. Further definitions, instructions and guidance and output reporting requirements are set out later in this chapter.

- the number of customers interrupted per year (CI) – the number of customers whose supplies have been interrupted per 100 customers per year over all incidents, where an interruption of supply lasts for three minutes or longer, excluding re-interruptions to the supply of customers previously interrupted during the same incident (see below for further details). It is calculated as:

$$\frac{\text{The sum of the number of customers interrupted for all incidents} * 100}{\text{The total number of customers}}$$

- the duration of interruptions to supply per year (CML) - average customer minutes lost per customer per year, where an interruption of supply to customer(s) lasts for three minutes or longer, calculated as:

$$\frac{\text{The sum of the customer minutes lost for all restoration stages for all incidents}}{\text{The total number of customers}}$$

- the number of customers interrupted by short interruptions per year (SI) – the number of customers whose supplies have been interrupted by a short interruption per 100 customers per year over all short interruptions, where the initial interruption to supply is restored in less than three minutes, calculated as:

$$\frac{\text{The sum of the number of customers interrupted by short interruptions} * 100}{\text{The total number of customers}}$$

- the number of customers re-interrupted per year (RI) – the number of customers whose supplies have been re-interrupted per 100 customers per year, calculated as:

$$\frac{\text{The sum of the number of customers re-interrupted} * 100}{\text{The total number of customers}}$$

Further definitions

Distribution System

3.6. "Distribution System" is defined in SLC 1 of the distribution licence. Transmission activities in Scotland encompass 132 kV electric lines and plant; therefore references to reporting on 132 kV in the RIGs are not applicable to the two Scottish DNOs¹⁷.

SLC 45 voltages/systems

¹⁷ SP Distribution Limited, and Scottish Hydro-Electric Power Distribution Limited.

3.7. Incidents at the following voltage levels must be included in reporting under SLC 45 following these instructions and guidance:

- 132 kV systems
- extra high voltage (EHV) systems (ie all voltages above 20kV up to but excluding 132 kV)
- HV systems (ie all voltages above 1kV up to and including 20kV)
- LV systems (ie voltages of 1 kV and below)
- LV services.

3.8. The upper and lower boundaries associated with these voltages are defined in Appendix 1 – Quality of Service, in this document.

Higher voltages

3.9. For the purposes of reporting under SLC 45, higher voltages include HV, EHV and 132 kV networks¹⁸.

Definition - Customer

3.10. For the purposes of SLC 45, charge restriction condition CRC8 and the NADPR RIGs only, customer means in relation to any energised or de-energised entry or exit point to the DNO's Distribution System, where metering equipment is used for the purpose of calculating charges for electricity consumption, the person who is providing or is deemed to be providing a supply of electricity through that entry point, or the person who is taking or is deemed to be taking a supply of electricity through that exit point.

3.11. Customers should be identified from Metering Point Administration Numbers (MPANs)¹⁹, such that an individual customer is identified at each connection point.

Guidance – Customer

3.12. Only one customer should be identified at each connection point. This means that multiple (or secondary) MPANs which arise due to the type of "tariff" (or

¹⁸ See Appendix 1 – Quality of Service - SLC 45 Voltage boundaries.

¹⁹ The Master Registration Agreement (MRA) is an agreement that sets out, amongst other things, the terms for metering point administration services and the requirements for the change of supplier process. Schedule 5 of the MRA sets out the form in which a supplier is obliged to print the supply number (attributed to a metering point) on a customer's bill. Within the industry the supply number is known as the metering point administration number (MPAN).

equivalent) and/or metering arrangements (eg import/export meters), but are associated with a single connection point, must not be counted.

3.13. In some cases (eg flats), the connection point may be from the Distribution System to wiring owned by a landlord or a facilities manager. In such cases, individual customers supplied by such wiring are classed as customers of the Distribution System where they are identifiable from MPANs.

3.14. Any changes to the method used by DNOs to identify customers from MPANs must be agreed in advance with Ofgem. Ofgem will want to ensure that, as far as possible, DNOs use a consistent method for identifying customers.

Definition - Total number of customers

3.15. The total number of customers is defined as the total number of customers whose supplies are connected to the DNO's distribution network as at 30 September in the relevant reporting year. Guidance on counting customers is set out in paragraphs 3.13 to 3.15.

Definition - Total number of new customers

3.16. The total number of new customers is defined as customers whose supplies have been connected between 1 October in the previous year and 30 September in the relevant year.

Definition - Total number of disconnected customers

3.17. The total number of disconnected customers is defined as customers whose supplies have been disconnected between 1 October in the previous year and 30 September in the relevant year. This count must also include any data cleansing of MPANs that has occurred between 1 October in the previous year and 30 September in the relevant year.

3.18. New and disconnected customers should be identified from MPANs such that the number of new and disconnected customers corresponds with the number of new and disconnected connection points on the Distribution System.

Definition - Incident

3.19. Incident is defined as any occurrence on the DNO's Distribution System or other connected distributed generation, transmission or Distribution System, which:

- results in an interruption of supply to customer(s) for three minutes or longer, or
- prevents a circuit or item of equipment from carrying normal load current or being able to withstand "through fault current" for three minutes or longer.

Guidance - Incident

3.20. Occurrences that are classed as an incident lasting three minutes or longer include:

- any physical break in the circuit upstream of the customers interrupted (or circuit affected), due to automatic or manual operation of switchgear or fusegear, or due to any other open circuit condition,
- the unprogrammed isolation of any circuit or item of equipment, energised at power system voltage, which has not been classified as a pre-arranged incident,
- failures of non-system equipment (eg pilot cables, oil and gas alarms, voltage control equipment etc) which result in the disconnection of equipment energised at power system voltage,
- incorrect operations of protection equipment which result in the disconnection of a circuit energised at power system voltage,
- failure of protection equipment to operate. This includes incidents where the main protection fails to operate and a fault clearance is initiated by back-up protection or protection at another point on the network,
- the loss of infeed from other connected systems, including those owned by NGET/transmission companies (in Scotland), other distribution companies and distributed generators, and
- the pre-arranged isolation of any circuit or item of equipment energised at power system voltage that results in loss of supply.

3.21. Occurrences that would not lead to an incident are as follows:

- maintenance outages and malfunctions of non-system equipment (eg pilot cables, etc) which do not result in the disconnection of a circuit or item of equipment energised at power system voltage,
- failures and overloads on customers' equipment or another connected system, which are cleared by the correct operation of the DNO's protection and which do not interrupt the supply to other customers of the DNO,
- pre-arranged works affecting customers for the purposes of meter changes, voltage standardisation and work on service cables and distributors' fuses, and
- interruptions to supply resulting from load shedding in compliance with statutory and/or licence obligations following upstream incidents relating to either transmission or generation activities.

- It should be noted that all occurrences that are as a result of cut-outs or any wiring and equipment connected after cut-outs, including cut-out fuse operations, are not an incident even where such occurrences have resulted in the operation of a fuse at the DNO's substation.

3.22. Any additional incidents which affect part of the network and/or customers already affected by an incident must also be reported as additional incidents. Two or more incidents may then be active concurrently and the number and duration of interruptions and the number of re-interruptions must be calculated accordingly.

Incident start

3.23. The incident start time is the earlier of the date and time at which:

- the first report is received of a loss of supply^{20,21,22} or other abnormality which prevents a circuit or other item of equipment from carrying normal load current or being able to withstand "through fault current" for three minutes or longer, or the relevant circuit is automatically, deliberately or otherwise disconnected.

Report received time

3.24. The report received time is the earliest time that a DNO became aware of a loss of supply, an abnormality or a suspected abnormality. It must be the earliest of the date and time at which:

- a customer (or other person) first contacted the DNO to advise of no-supply, an abnormality or suspected abnormality
- an alarm was received by the DNO indicating a loss of supply, abnormality or suspected abnormality or
- a DNO employee or agent identified the existence of a loss of supply, abnormality or suspected abnormality.

²⁰ Neutral alarms or indication of reduced feeder load should not be taken as the start time.

²¹ Where a customer (or customers) reports "low volts" then this should not be treated as a loss of supply, until the DNO confirms that the customer(s) is off supply. Equally, where a report of "reverse polarity" is received by the DNO, the customer(s) should be considered "on supply" until the DNO confirms that the customer(s) is off supply, or needs to be disconnected in order to carry out repairs to the DNO's network.

²² An incident is considered to have started when either the first "no supply" call or confirmation from site of an abnormality is received.

3.25. For reports that are associated with a loss of supply or other abnormality which prevents a circuit or other item of equipment from carrying normal load current or being able to withstand “through fault current” for three minutes or longer, the report received time will coincide with the incident start time. For other reports the report received time may precede the incident start time, for example:

- when deliberate disconnection is undertaken some time after the report is received, or
- when some faults are held by arc suppression.

3.26. In respect of loss of supply, some DNOs wait for a second report before initiating action. However, for the purposes of reporting under SLC 45 the incident start time must be based on the time of the first report received. The date and time of an incident is the time at which the DNO first becomes aware of the incident by any means.

3.27. In respect of calls related to low voltages, the response of the DNO will vary depending on the information that has been provided by the customer (or customers). The advice given to the customer will determine the DNOs recorded incident start time or not as per the guidance outlined in 3.24 to 3.26, for example:

- if a DNO advises a customer to isolate their supply, then the time of this advice being given shall be recorded as the start time of this incident.

Incident completion

3.28. The determination of when an incident is considered complete is dependent on whether or not a temporary supply arrangement²³ has been used to restore supplies.

3.29. Where a temporary supply arrangement has not been used to restore supplies, an incident is considered complete when supplies have been restored to all customers involved in the incident for a period of at least 3 hours. This does not require the restoration of the normal network configuration and open points.

3.30. Where a temporary supply arrangement has been used to restore supplies, an incident is considered complete when supplies have been restored to all customers involved in the incident for a period of at least 18 hours.

3.31. As outlined in 3.30 and 3.31, any interruptions to supply caused by the removal of a temporary supply to reconnect, where done within 18 hours of restoring supplies via that temporary connection, must be counted as a re-interruption to

²³ Defined in paragraph 3.66.

supply. Any failures of a temporary supply arrangement, such as a generator running out of fuel, must be treated as a new interruption to supply and reported accordingly if this takes place after supplies have been restored to all customers involved in the incident for a period of at least 18 hours, otherwise this must be treated as a re-interruption.

3.32. As outlined in 3.30 and 3.31, if there is a further loss of supply due to an unrelated occurrence, eg an incident on an adjacent circuit, to some or all of the same customers before incident completion, then this must be treated as a separate incident and the losses of supply must be counted as interruptions.

3.33. As outlined in 3.30 and 3.31 and for any reason, if there is a further loss of supply to some or all of the same customers after incident completion, this must be treated as a separate incident and the losses of supply must be treated as interruptions.

3.34. Where an incident start time and completion time/date span two reporting years, the incident must be allocated to the year in which it started.

Definition - Unplanned incident on the Distribution System

3.35. Any incident arising on the licensee's Distribution System, where statutory notification²⁴ has not been given to all customers affected at least 48 hours before the commencement of the earliest interruption (or such notice period of less than 48 hours where this has been agreed with the customer(s) involved).

Definition - Pre-arranged incident

3.36. Any incident arising from the pre-arranged isolation of any circuit or item of equipment energised at power system voltage that results in loss of supply and where statutory notification has been given to all customers affected at least 48 hours before the commencement of the earliest interruption (or such notice period of less than 48 hours where this has been agreed with the customer(s) involved), and where the loss of supply start time is not before that notified to customers.

Guidance – Pre-arranged incident

3.37. A pre-arranged incident which requires a number of switching operations involving an interruption to supply to customers must be treated as a single incident, provided that the outage start time is within the period stated on the notification provided to the customer(s). Whether or not the outage restoration time is outside

²⁴ SI 2010 No. 698 The Electricity (Standards of Performance) Regulations 2010 Regulation 14

the period stated on the notification provided to the customer(s), the full length of the outage must be recorded as part of the planned incident. A record must also be kept of the times notified to the customer(s) and the actual interruption times. Where the affected customers have agreed to a shorter notice period for a pre-arranged interruption or this interruption starts before the original notice period at the request of customers, the interruptions to these customers must be recorded as pre-arranged incidents, but only where there is auditable evidence, eg a note in the incident log detailing the revised interruption time.

3.38. Where the outage start time is before the period stated on the notification provided to the customer(s) and the affected customers have not agreed to or requested the earlier start time, the interruption of supply to the customer(s) must be recorded as an unplanned incident.

3.39. Where statutory notification has not been provided to one or more customers or the customer(s) has not agreed a shorter notice period, then the customer(s) must be recorded separately as part of an unplanned incident. The interruption to supply of all of the customers that received statutory notice (or agreed a shorter notice period) must still be reported as a pre-arranged incident.

Definition - Incident on other systems

3.40. Any incident arising on other connected electricity systems which leads to the interruption of supply to the customers of the licensee, including:

- National Grid Company (NGET) or transmission companies (in Scotland)
- distributed generators
- any other connected systems – which must be identified.

Definition - Non-damage incident

3.41. A non-damage incident is defined as any unplanned incident where supply can be restored from the original source by network switching and without the need for the repair of equipment. For example:

- the remote or manual operation of a pole mounted auto recloser that had previously completed its duty cycle and locked out, to restore supplies, is regarded as network switching,
- the changing of a blown fuse is regarded as network switching and is therefore not considered to be a repair of equipment, and
- the removal of trees from an otherwise healthy overhead line is not considered to be the repair of equipment.

Definition - Damage incident

3.42. A damage incident is defined as any unplanned incident where it is necessary to repair equipment. For example, the changing of a damaged insulator is considered to be a repair.

Definition – Interruption

3.43. An interruption is defined as the loss of supply of electricity to one or more customers due to an incident but excluding voltage quality²⁵ and frequency abnormalities, such as dips, spikes or harmonics.

Guidance – Interruption

Interruption sequences

3.44. An incident may include both a loss of supply of less than 3 minutes' duration and a loss of supply of 3 minutes or longer. Under such circumstances, where the loss of supply of less than 3 minutes' duration occurs first, it must be reported as a short interruption. Where an interruption lasts for 3 minutes or longer, further losses of supply of less than 3 minutes' duration during the course of the same incident must not be recorded either as part of the incident or as a short interruption.

3.45. In determining interruption sequences above, restorations of less than 3 minutes must be ignored, ie the interruption sequence would be determined as if there had been no such restoration. For example, where a customer is interrupted for 2 minutes, restored for 2 minutes, then interrupted for 30 minutes and subsequently restored for 3 minutes or more, the duration of the interruption would be 34 minutes.

Definition – Non quality of service occurrences

3.46. Non quality of service occurrences are defined as incidents where no customer is interrupted, yet an incident been logged on the Distribution Network Operators systems.

Guidance – Non quality of service occurrences

²⁵ Where a customer (or customers) reports "low volts" then this should not be treated as a loss of supply, until the DNO confirms that the customer(s) is off supply. Equally, where a report of "reverse polarity" is received by the DNO, the customer(s) should be considered "on supply" until the DNO confirms that the customer(s) is off supply, or needs to be disconnected in order to carry out repairs to the DNO's network.

3.47. Each occurrence must be identified by a reference number, along with the voltage, the start time and date of the occurrence and the reason why it is not considered a non reportable occurrence.

Definition - Short interruption

3.48. Short interruptions are defined as the loss of supply of electricity to one or more customers due to automatic, manual or remote control operation of switchgear or fusegear on the Distribution System or other systems, upstream of the customers interrupted, where supply is restored in less than three minutes. (Note an initial loss of supply of electricity for less than 3 minutes must be treated as a short interruption rather than an interruption.)

Guidance – Short interruption

3.49. In the case of multi-shot reclosing schemes, only one short interruption is to be counted where the successful restoration is achieved by a sequence of multiple operations in less than three minutes, where these are identifiable. Where the sequence of operations is not identifiable, a simple count of all operations of automatic reclosing devices could be used, excluding those operations recorded elsewhere, eg those associated with other incidents or routine switching.

3.50. The number of customers interrupted must be identified in the same way as for incidents (ie those situations where customers are off supply for three minutes or longer). If a DNO uses periodic counts of recloser operations to calculate the number of short interruptions, the number of customers interrupted will be based on an estimate of those customers who would have been interrupted. The DNO must base this estimate on the assumption that the circuit affected was configured normally, unless the DNO has robust information that there were abnormal feeding arrangements in place at the time.

3.51. The dates and times of short interruptions are not required. Where short interruptions are identified from a periodic count of circuit breaker operations, the counters must be read annually between 1 January and 31 March to ensure a reasonable approximation to a 12-month total.

Definition - Re-interruption

3.52. A re-interruption is defined as the loss of supply of electricity to one or more customers, for a period of 3 minutes or longer, where those same customers have experienced an interruption during previous restoration stages of the same incident.

Definition - Restoration stage

3.53. A restoration stage is defined as a stage of an incident, at the end of which supply to some or all customer(s) is restored and/or a circuit or part of a circuit is re-

energised, excluding any restoration/re-energisation which is followed within 3 minutes by a circuit trip.

Guidance – Restoration stage

3.54. Where a customer's supply is restored for a period of less than three minutes, the calculation of the duration of interruptions to supply must ignore the time for which customers' supplies were restored, ie the minutes for which the customers are restored will be included in the count of minutes lost as if there were no restoration.

3.55. There must be no limit to the number of restoration stages for an incident.

Start of a restoration stage

3.56. The start of a restoration stage is the date and time at which supply to customer(s) is interrupted and/or a circuit or part of a circuit is de-energised.

End of a restoration stage

3.57. The end of a restoration stage is the date and time at which customer(s) have their supply restored and/or a circuit or part of a circuit is re-energised.

Customers involved in a restoration stage

3.58. The customers involved in a restoration stage are defined as the customers connected to that part of the DNO's distribution network restored in the restoration stage, including restorations from mobile generators and temporary connections.

3.59. The number of customers interrupted for single-phase and two-phase LV incidents may be calculated on a pro rata basis, ie 1/3 or 2/3 of the total number of customers connected to the LV circuit, or part of circuit, affected. Customers with a three-phase LV supply (where these can be identified) are considered to be interrupted when supply is interrupted to one or more of the three phases. Individual customer phase connections do not need to be identified for the purpose of reporting under SLC 45. It might be helpful, in terms of the audit process, if DNOs recorded the number and phases of fuses that have operated in the event of an incident on the LV system.

3.60. For HV incidents, in the interest of simplicity and consistent reporting, if one phase of a three-phase circuit is disconnected it must be considered that two-thirds

of customers connected downstream of the point of disconnection had their supplies interrupted.

3.61. Where a connectivity model is in place it must be used consistently²⁶ to derive the number of customers interrupted on a particular element (eg LV feeder) of the network modelled. Where the section of network involved is a subset of a modelled network element (eg LV service), the number of customers interrupted may be derived from records or from information available on site, supported by an appropriate audit trail, eg the property numbers involved, the location of the open circuit fault.

3.62. Customers involved for HV, EHV and 132 kV must take account of the real-time changes to 132 kV/EHV/HV network configuration during restoration, which may be identified from a connectivity model.

3.63. Customers involved in each restoration stage may be identified from a connectivity model in which customer information is individually linked with the appropriate section of network to which they are connected.

3.64. The date and time of interruption and the date and time of restoration must be recorded for each restoration stage. The numbers of customers involved and the elapsed time in each restoration stage will be used to calculate the number of customers interrupted and duration of interruptions to supply.

Definition - Temporary supply arrangement

3.65. A temporary supply arrangement is the use of temporary connections, temporary disconnections or mobile generation in order to provide temporary restoration of supplies during an incident.

Definition - Temporary connection

3.66. A temporary connection is a connection (made without using normal switching devices) which is not to become a permanent feature of the Distribution System, but which is used solely to provide a temporary restoration of supplies during an incident.

²⁶ As such where the number of calls exceeds the number of customers predicted as being off supply the DNO must adhere to the model, taking account of any three-phase LV customers, although Ofgem would expect to see robust processes in place to identify and correct mis-allocated customers.

Guidance – Temporary connection

3.67. An LV backfeed that is a permanent feature of the Distribution System must not be treated as a temporary connection. The bunching of two phases or the use of a temporary loop service are to be treated as temporary connections.

Definition - Temporary disconnection

3.68. A temporary disconnection is a deliberate break in the continuity of a circuit, which is not to become a permanent feature of the Distribution System, but is used solely to facilitate the temporary restoration of supplies during an incident.

Definition – Clock stopping

3.69. Clock stopped is defined as the ability, in circumstances as described in paragraphs 3.71 to 3.74, to legitimately stop the count of the number of minutes that customers are off supply even though supply has not been restored.

Guidance – Clock stopping

3.70. Where access to customers' premises necessary to restore supplies is not available, the DNO must stop the clock for the period where access is not available. The clock must be restarted as soon as access is available. The DNO must keep appropriate audit records of the inability to gain access and the associated delay.

3.71. Where a customer requests that restoration work be delayed, the DNO must stop the clock for the period requested by the customer. The clock must be restarted at the time agreed with the customer that the delay in restoration work would end. The DNO must keep appropriate audit records of the customer request and agreed delay.

3.72. Where access necessary to restore supplies is explicitly prevented by the emergency services, government authorities or other utilities (eg gas and water) (and supplies cannot be restored through other means such as remote switching or network reconfiguration and the use of temporary generation is not economic), the DNO must stop the clock for the period where access is denied. The DNO must keep auditable records detailing orders given by the emergency services or government authorities and the times of the orders. The clock must be restarted as soon as access is available.

3.73. Where the DNO is in a position to restore supplies but the customer either requests to be left off supply, or they have to reset their own equipment, then the DNO must treat the time they were able to restore supplies, but prevented from doing so by customer request, as the restoration time and classify this as a temporary supply arrangement.

Updating the connectivity model

3.74. It is important that the connectivity model is kept up to date. The accuracy with which the number and duration of interruptions to supply are reported is, in part, determined by the frequency with which the connectivity model is updated. A reasonable timeframe for updating the connectivity model is likely to be within 14 days of the DNO being formally notified of any permanent changes to the network or customer connections. (For example, a change expected to be in place for at least 28 consecutive days may be regarded as a permanent change). In addition, the numbers of customers in the model could be reconciled with the total number of connected customers on a monthly basis.

Output reporting requirements

Customers

3.75. DNOs are required to report information on the number of customers according to the following categories:

- total number of customers
- total number of new customers
- total number of disconnected customers.

Disaggregation of incidents

3.76. It is necessary to collect information on the number of customers interrupted and duration of interruptions to supply at a disaggregated level. This will help in comparing performance across DNOs, setting performance targets and determining appropriate audit samples, and could be used for making adjustments within the incentive scheme. There are five types of mutually exclusive disaggregation required, these are:

- by incident and restoration stage
- by source, voltage level and main equipment involved (MEI)
- by duration band (both pre-arranged and unplanned CI)
- by frequency band (higher voltage unplanned CI only)
- by HV circuit.

Disaggregation by both incident and restoration stage

3.77. In addition to reporting on the effect on customers of all incidents arising on the Distribution System, the number of customers interrupted and duration of interruptions to supply must be reported separately by incident and restoration stage.

Disaggregation by "source", voltage level and main equipment involved (MEI)

3.78. In addition to the above the number of customers interrupted and duration of interruptions to supply arising from the following categories must be separately identified:

- unplanned incidents on the Distribution System in total and by the following classifications:
 - 132 kV non-damage
 - 132 kV damage
 - EHV non-damage
 - EHV damage
 - HV non-damage
 - HV damage
 - LV non-damage
 - LV overhead mains - damage
 - LV underground mains - damage
 - LV all other switchgear, plant and equipment - damage
 - LV services overhead (excl cut-outs) – damage and non-damage
 - LV services underground (excl cut-outs) – damage and non-damage.

3.79. DNOs are required to provide cause code and MEI information for every unplanned damage incident. For incidents at HV DNOs must also provide the unique circuit identification number as set out in paragraph 3.87.

3.80. DNOs are required to identify pre-arranged incidents on the Distribution System by the following classifications:

- EHV
- HV pole-mounted or overhead
 - Load related
 - Non-load related
 - Inspection, maintenance and repair
 - Tree cutting
 - LCNF T1
 - LCNF T2
- HV ground-mounted or underground
 - Load related
 - Non-load related
 - Inspection, maintenance and repair
 - Tree cutting
 - LCNF T1
 - LCNF T2
- LV pole-mounted or overhead
 - Load related
 - Non-load related
 - Inspection, maintenance and repair
 - Tree cutting
 - LCNF T1

- LCNF T2
- LV ground-mounted or underground
 - Load related
 - Non-load related
 - Inspection, maintenance and repair
 - Tree cutting
 - LCNF T1
 - LCNF T2.

3.81. DNOs are also required to provide incident and stage information relating to:

- incidents on the systems of NGET or the transmission companies (in Scotland)
- incidents on the systems of distributed generators
- incidents on any other connected systems – which must be identified.

Disaggregation by duration band (pre-arranged and unplanned CI only)

3.82. DNOs are required to separately disaggregate both the pre-arranged and unplanned number of customers interrupted (including all voltage levels) by duration band in order to provide a better understanding of how customer minutes lost are made up and of DNOs' effectiveness in restoring customers' supplies following an interruption. The customer minutes lost used for this disaggregation must be post any clock stopping.

3.83. DNOs must report separately both the pre-arranged and unplanned number of customers interrupted (excluding re-interruptions and re-interruptions only) by the following duration bands:

- 3 minutes up to but excluding 1 hour
- 1 hour up to but excluding 2 hours
- 2 hours up to but excluding 3 hours
- 3 hours up to but excluding 6 hours
- 6 hours up to but excluding 12 hours, etc.

in 6-hour bands up to and including the longest time any customers have been recorded as being off supply. Time bands with no customers interrupted must be reported with a zero count.

Disaggregation by frequency band (higher voltage unplanned CI only)

3.84. DNOs must report the unplanned number of customers interrupted (excluding re-interruptions) by frequency band starting with customers experiencing zero higher voltage interruptions and rising in single increments up to customers experiencing 10 higher voltage interruptions. The DNO must also identify the total number of customers experiencing more than 10 higher voltage interruptions and the largest

number of higher voltage interruptions experienced by any customer. (Higher voltage interruptions include HV, EHV and 132 kV interruptions).

Disaggregation by HV circuit

3.85. The number of unplanned incidents, customers interrupted and duration of interruptions to supply arising on HV systems need to be reported by HV circuit to support work on comparing quality of service performance.

3.86. For each HV circuit DNOs must report the following circuit characteristics and performance information:

- the unique circuit identifier (where possible this must be the same as for previous years so that comparisons can be made over time)
- the voltage level (eg 6.6 kV, 11 kV, 20 kV)
- the number of connected customers (on 31 March)
- the length of overhead line in kilometres (on 31 March)
- the length of underground cable in kilometres (on 31 March)
- the number of incidents affecting the circuit
- the total number of customer minutes lost
- the total number of customers interrupted (excluding re-interruptions).

3.87. Two versions of the HV circuit information must be provided:

- containing all HV incidents and associated customers interrupted and customer minutes lost
- excluding HV incidents, customers interrupted and customer minutes lost for the duration of events for which exemptions have been requested and which meet the criteria set out in special condition CRC8 of the distribution licence. The approach to treating such events must be agreed with Ofgem in advance of the data being provided. DNOs must provide summary data for the events which have been excluded including: the number of days' performance which has been

removed, the number of incidents, customers interrupted and customer minutes lost²⁷.

3.88. DNOs must also provide total number of incidents, total number of customers interrupted and total number of customer minutes lost for any incidents that are not attributable to specific circuits. These must be grouped into one of the two following categories (see reporting workbook for more detail):

- changes to HV topology or misallocation (eg circuit removed during the reporting period)
- loss of HV circuit infeed (eg a fault on an 11 kV bus-bar).

3.89. In addition to the above, for each loss of HV circuit infeed, the number of customers interrupted and number of customer minutes lost for each incident must be provided.

3.90. The incidents, total number of customers interrupted and total number of customer minutes lost for the disaggregated reporting for HV circuits plus unattributable HV performance must reconcile with the total HV performance.

Definition of a HV circuit

3.91. The DNOs have submitted their existing mix of circuit types to Ofgem. Any change in the definition of "HV circuits" to be used when reporting performance on a disaggregated circuit-by-circuit basis must be agreed with Ofgem in advance of the data being provided.

Circuits with non-zero length and non-zero connected customers

3.92. These are valid circuits and must be included in the HV circuit dataset submitted by DNOs.

Circuits with non-zero length and zero connected customers

3.93. These are valid circuits that would normally be used to provide alternative supplies to one or more customers. These circuits must be included in the HV dataset submitted by DNOs. However, customers interrupted and customer minutes lost per customer would be inconsistent with zero connected customers. Therefore it will be

²⁷ The performance figures excluding exceptional events plus the summary data for those events should reconcile with the information containing all incidents requested in paragraph 3.87.

necessary for DNOs to re-attribute any incidents, customers interrupted and customer minutes lost as if the network were normally configured.

Circuits with zero length and non-zero connected customers

3.94. This classification of circuits is present for two reasons;

- a circuit exists but there is actually no circuit length, eg the exit point of a customer's connection is the circuit breaker, or
- a circuit exists and there is actual circuit length that is not being reported by the functionality of the mapping system or GIS.

3.95. In both cases, these are valid circuits that must be included in the HV circuit dataset submitted by DNOs. However, in order to include such circuits in the dataset, a nominal circuit length of 100 metres must be attributed to each of these circuits.

Circuits with zero length and zero connected customers

3.96. These HV circuits are not valid and must not be included in the HV circuit dataset submitted by DNOs. Where appropriate any incidents, customers interrupted and customer minutes lost must be re-attributed as if the network were normally configured.

Disaggregation by non quality of service occurrences

3.97. For the purpose of reporting under SLC 45, DNOs are required to report the total number of non quality of service occurrences according to the following categories:

- Power system voltage equipment/no unplanned incident
- Other occurrences (not affecting power system voltage equipment)
- Calls logged in reporting system but not causing DNO activity.

3.98. These categories should comprise of incidents as outlined here:

- Power system voltage equipment/no unplanned incident, which contains:
 - Emergency disconnections (eg at request of emergency services)
 - Streetlights/Street Furniture/Unmetered Services/Unmetered Cut Outs
 - Cut Outs
 - Cut Out Fuses Only
 - Asset repairs instigated by trouble calls (eg OH service bracket repair).

- Other occurrences (not affecting power system voltage equipment), which contains:
 - Abortive visits
 - Meters
 - Responding to critical safety calls (eg substations door open)
 - Pilot wire failures.

- Calls logged in reporting system but not causing DNO activity, should include:
 - Occurrences not requiring site visits
 - All other calls logged but not pursued by DNO²⁸.

3.99. DNOs are required to report the total number of non reportable incidents for each classification according to the following categories in the respective categories:

- Incident reference number
- Voltage
- Start date and time of incident.

Short interruptions

3.100. For the purpose of reporting under SLC 45, DNOs are required to report the total number of short interruptions and disaggregated number of short interruptions by the following four causes:

- due to the automatic operation of distribution network switchgear where the supplies of some or all of the customers involved are successfully restored by automatic switching within less than three minutes of the first interruption,
- due to the automatic operation of distribution network switchgear where the supplies of some or all of the customers involved are successfully restored by manual or remote control switching within less than three minutes of the first interruption. This definition includes only the initial restoration. Further short interruptions during subsequent stages of fault sectionalising are not to be reported,
- due to the manual or remote operation of distribution network switchgear for reasons such as deliberate disconnection for operational or emergency reasons, and

²⁸ DNOs are to input the total number of occurrences related to this category in the Total worksheet.

- due to the operation of switchgear on the networks of NGET/transmission companies (in Scotland) or other connected systems and distributed generators.

3.101. Short interruptions do not need to be disaggregated by voltage or by HV circuit. Where DNOs make significant use of automatic reclosing devices and automatic switching at the LV level, the number of short interruptions at this voltage level must be included in the appropriate short interruption categories identified above.

Required level of accuracy for reporting interruptions data

3.102. Ofgem considers that it is important that information used to implement the incentive scheme is sufficiently accurate to enable comparisons to be made over time and if appropriate between DNOs. Ofgem has specified minimum levels of accuracy for the reporting of:

- the number of customers interrupted – at the 132kV and EHV, the HV and LV levels
- the duration of interruptions to supply – at the 132kV and EHV, the HV and LV levels.

3.103. Table 3.1 below specifies the minimum levels of accuracy required for the reporting of the number of customers interrupted and duration of interruptions to supply. DNOs are required to meet the minimum levels of accuracy for the three voltage categories shown below. Meeting one of the required levels of accuracy is not sufficient to satisfy the requirements set out in SLC 45.

Table 3.1 Accuracy thresholds

Voltage	Overall accuracy	Initial stage accuracy (smaller sample)
EHV and 132kV	97 per cent	99 per cent
HV	95 per cent	97 per cent
LV	90 per cent	93 per cent

Appendices

Index

Appendix	Name of Appendix	Page Number
1	Quality of Service Appendix	74
2	The Authority's Powers and Duties	86
3	Feedback Questionnaire	88

Appendix 1 – Quality of Service Appendix

Purpose of SLC 45 information

1.1. The table below sets out the purpose for which the specified information as set out in SLC 45, and described in detail in chapter 3 of this document, will be used. It does not specify how this information will be used in the incentive scheme.

Information relating to number of customers interrupted and duration of interruptions	Purpose	
	Incentive scheme	Other
Number of customers interrupted by short interruptions of less than three minutes, including disaggregated by "cause"		Yes
Number of customers interrupted for three minutes or more	Yes	
Duration of interruptions to supply of three minutes or more	Yes	
Number of customers interrupted and duration of interruptions to supply of three minutes or more disaggregated by: incident and restoration stage; source, voltage level and MEI; duration band; frequency of interruption; and HV circuit.	Yes Yes	Yes Yes Yes
Aggregate number of customers re-interrupted		Yes

Formulae for the purposes of reporting

1.2. This appendix sets out formulaic expressions for:

- the number of customers interrupted in the relevant year t (excluding re-interruptions)
- the duration of interruptions to supply in the relevant year t .

Definitions

C_{It} = the number of customers interrupted in the relevant year t , **excluding re-interruptions.**

CML_t = the duration of interruptions to supply in the relevant year t , **including re-interruptions.**

i = an unplanned incident on the distribution system.

j = a pre-arranged incident on the distribution system.

k = an incident on a transmission system such as the systems of NGET or transmission companies in Scotland.

l = an incident on a distributed generator's system.

m = an incident on any other connected system.

r = a restoration stage in any incident i, j, k, l, m .

t = relevant year (that financial year for the purposes of which any calculation falls to be made).

T_{Ct} = total connected customers in the relevant year t .

TR_{rit} = the restoration time of restoration stage r of an unplanned incident i in the relevant year t .

TR_{rjt} = the restoration time of restoration stage r of a pre-arranged incident j in the relevant year t .

TR_{rkt} = the restoration time of restoration stage r of an incident k on NGET's system or a transmission company's system in Scotland in the relevant year t .

TR_{rlt} = the restoration time of restoration stage r of an incident l on a distributed generator's system in the relevant year t .

TR_{rmt} = the restoration time of restoration stage r of an incident m on any other connected system in the relevant year t .

TI_{rit} = the interruption time prior to the restoration time of restoration stage r of an unplanned incident i in the relevant year t .

TI_{rjt} = the interruption time prior to the restoration time of restoration stage r of a pre-arranged incident j in the relevant year t .

TI_{rkt} = the interruption time prior to the restoration time of restoration stage r of an incident k on NGET's system or a transmission company's system in Scotland in the relevant year t .

TI_{rlt} = the interruption time prior to the restoration time of restoration stage r of an incident l on a distributed generator's system in the relevant year t .

TI_{rmt} = the interruption time prior to the restoration time of restoration stage r of an incident m on any other connected system in the relevant year t .

and:

ND_{rit} = Number of customers interrupted in restoration stage r of an unplanned incident i in the relevant year t , excluding re-interruptions to supply.

NDrjt = Number of customers interrupted in restoration stage r of a pre-arranged incident j in the relevant year t, excluding re-interruptions to supply.

NDrkt = Number of customers interrupted in restoration stage r of an incident k on NGET's system or a transmission company's system in Scotland in the relevant year t, excluding re-interruptions to supply.

NDrlt = Number of customers interrupted in restoration stage r of an incident l on a distributed generator's system in the relevant year t, excluding re-interruptions to supply.

NDrmt = Number of customers interrupted in restoration stage r of an incident m on any other connected system in the relevant year t, excluding re-interruptions to supply.

NNrit = Number of customers interrupted in each restoration stage r of an unplanned incident i in the relevant year t, including re-interruptions to supply.

NNrjt = Number of customers interrupted in restoration stage r of a pre-arranged incident j in the relevant year t, including re-interruptions to supply.

NNrkt = Number of customers interrupted in restoration stage r of an incident k on NGET's system or a transmission company's system in Scotland in the relevant year t, including re-interruptions to supply.

NNrlt = Number of customers interrupted in each restoration stage r of an incident l on a distributed generator's system in the relevant year t, including re-interruptions to supply.

NNrmt = Number of customers interrupted in restoration stage r of an incident m on any other connected system in the relevant year t, including re-interruptions to supply.

Formulae

CI_t is the number of customers interrupted per year in the relevant year t and is derived from the following formula: $CI_t = CIA_t + CIB_t + CIC_t + CID_t + CIE_t$

Where

CIA_t is the number of customers interrupted per year arising from unplanned incidents on the distribution system in the relevant year t and is derived from the following formula:

$$CIA_t = \frac{\left(\sum_i \sum_r ND_{rit} \right) * 100}{TC_t}$$

CIB_t is the number of customers interrupted per year arising from pre-arranged incidents on the distribution system in the relevant year t and is derived from the following formula:

$$CIB_t = \frac{\left(\sum_j \sum_r ND_{ijt} \right) * 100}{TC_t}$$

CIC_t is the number of customers interrupted per year arising from incidents on the systems of NGET or transmission companies in Scotland in the relevant year t and is derived from the following formula:

$$CIC_t = \frac{\left(\sum_k \sum_r ND_{rkt} \right) * 100}{TC_t}$$

CID_t is the number of customers interrupted per year arising from incidents on the systems of distributed generators in the relevant year t and is derived from the following formula:

$$CID_t = \frac{\left(\sum_l \sum_r ND_{rlt} \right) * 100}{TC_t}$$

CIE_t is the number of customers interrupted per year arising from incidents on any other connected systems in the relevant year t and is derived from the following formula:

$$CIE_t = \frac{\left(\sum_m \sum_r ND_{rmt} \right) * 100}{TC_t}$$

Each of the terms CIA_t, CIB_t, CIC_t, CID_t and CIE_t should be separately identified.

CML_t is the duration of interruptions to supply in the relevant year t and is derived from the following formula:

$$CML_t = CMLA_t + CMLB_t + CMLC_t + CMLD_t + CMLE_t$$

CMLA_t is the duration of interruptions from unplanned incidents on the distribution system in the relevant year t and is derived from the following formula:

$$CMLA_t = \frac{\sum_i \sum_r \left(IN_{rit} * (R_{rit} - T_{rit}) \right)}{TC_t}$$

CMLB_t is the duration of interruptions from pre-arranged incidents on the distribution system in the relevant year t and is derived from the following formula:

$$\text{CMLB}_t = \frac{\sum_j \sum_r (\text{NN}_{ijt} * (\text{TR}_{ijt} - \text{TI}_{ijt}))}{\text{TC}_t}$$

CMLCt is the duration of interruptions arising from incidents on the systems of NGET or transmission companies in Scotland in the relevant year t and is derived from the following formula:

$$\text{CMLC}_t = \frac{\sum_k \sum_r (\text{NN}_{rkt} * (\text{TR}_{rkt} - \text{TI}_{rkt}))}{\text{TC}_t}$$

CMLDt is the duration of interruptions arising from incidents on the systems of distributed generators in the relevant year t and is derived from the following formula:

$$\text{CMLD}_t = \frac{\sum_l \sum_r (\text{NN}_{rlt} * (\text{TR}_{rlt} - \text{TI}_{rlt}))}{\text{TC}_t}$$

CMLEt is the duration of interruptions arising from incidents on any other connected systems in the relevant year t and is derived from the following formula:

$$\text{CMLE}_t = \frac{\sum_m \sum_r (\text{NN}_{rmt} * (\text{TR}_{rmt} - \text{TI}_{rmt}))}{\text{TC}_t}$$

Each of the terms CMLAt, CMLBt, CMLCt, CMLDt and CMLEt should be separately identified.

Other formulae

1.3. This section sets out formulaic expressions for:

- the number of customers interrupted by short interruptions in the relevant year t (excluding re-interruptions), and
- the number of customers re-interrupted in the relevant year t.

Definitions

RIIt = the number of customers re-interrupted in the relevant year t.

n = a short interruption due to the automatic operation of distribution network switchgear where the supplies of some or all of the customers involved are successfully restored by automatic switching within less than three minutes of the first interruption.

o = a short interruption due to the automatic operation of distribution network switchgear where the supplies of some or all of the customers involved are

successfully restored by manual or remote control switching within less than three minutes of the first interruption.

p = a short interruption due to the manual or remote operation of distribution network switchgear for reasons such as deliberate disconnection for operational or emergency reasons.

q = a short interruption due to the operation of switchgear on the networks of NGET/transmission companies (in Scotland) or other connected systems and distributed generators.

SI_t = the number of short interruptions to supply in the relevant year t.

NS_{nt} = the number of customers interrupted by a short interruption in category n in the relevant year t.

NS_{ot} = the number of customers interrupted by a short interruption in category o in the relevant year t.

NS_{pt} = the number of customers interrupted by a short interruption in category p in the relevant year t.

NS_{qt} = the number of customers interrupted by a short interruption in category q in the relevant year t.

Formulae

SI_t is the number of customers interrupted by short interruptions in the relevant year t and is derived from the following formula:

$$SI_t = SIA_t + SIB_t + SIC_t + SID_t$$

where:

SIA_t is the number of customers interrupted by short interruptions in the relevant year t due to the automatic operation of distribution network switchgear where the supplies of some or all of the customers involved are successfully restored by automatic switching within less than three minutes of the first interruption and is derived from the following formula:

$$SIA_t = \frac{\left(\sum_n NS_{nt} \right) * 100}{TC_t}$$

SIB_t is the number of customers interrupted by short interruptions in the relevant year t due to the automatic operation of distribution network switchgear where the supplies of some or all of the customers involved are successfully restored by manual or remote control switching within less than three minutes of the first interruption and is derived from the following formula:

$$SIB_t = \frac{\left(\sum_o NS_{ot} \right) * 100}{TC_t}$$

SICt is the number of customers interrupted by short interruptions in the relevant year t due to the manual or remote operation of distribution network switchgear for reasons such as deliberate disconnection for operational or emergency reasons and is derived from the following formula:

$$SIC_t = \frac{\left(\sum_p NS_{pt} \right) * 100}{TC_t}$$

SIDt is the number of customers interrupted by short interruptions in the relevant year t due to the operation of switchgear on the networks of NGET/transmission companies (in Scotland) or other connected systems and distributed generators and is derived from the following formula:

$$SID_t = \frac{\left(\sum_q NS_{qt} \right) * 100}{TC_t}$$

Each of the terms SIA_t, SIB_t, SIC_t and SID_t should be separately identified.

RI_t is the number of customers re-interrupted in the relevant year t and is derived from the following formula:

$$RI_t = RIA_t + RIB_t + RIC_t + RID_t + RIE_t$$

where:

RIA_t is the number of customers re-interrupted in the relevant year t arising from unplanned incidents on the distribution system and is derived from the following formula:

$$RIA_t = \frac{\left(\sum_i \sum_r (NN_{rit} - ND_{rit}) \right) * 100}{TC_t}$$

RIB_t is the number of customers re-interrupted in the relevant year t arising from pre-arranged incidents on the distribution system and is derived from the following formula:

$$RIB_t = \frac{\left(\sum_j \sum_r (NN_{ijt} - ND_{ijt}) \right) * 100}{TC_t}$$

RIB_t is the number of customers re-interrupted in the relevant year t arising from incidents on the systems of NGET or transmission companies in Scotland and is derived from the following formula:

$$RIC_t = \frac{\left(\sum_k \sum_r (NN_{rkt} - ND_{rkt}) \right) * 100}{TC_t}$$

RID_t is the number of customers re-interrupted in the relevant year t arising from incidents on the systems of distributed generators and is derived from the following formula:

$$RID_t = \frac{\left(\sum_l \sum_r (NN_{rlt} - ND_{rlt}) \right) * 100}{TC_t}$$

RIE_t is the number of customers re-interrupted in the relevant year t arising from incidents on any other connected systems and is derived from the following formula:

$$RIE_t = \frac{\left(\sum_m \sum_r (NN_{rmt} - ND_{rmt}) \right) * 100}{TC_t}$$

SLC 45 Voltage boundaries

1.4. This section sets out the definition of voltage boundaries.

132 kV systems

1.5. The "lower boundary" of the 132 kV²⁹ system should be taken as the supply terminals of the DNO's customers supplied at 132 kV or the load-side terminals of switchgear controlling the secondary (lower voltage) side of 132 kV transformers. If no switchgear exists between the secondary side of the 132 kV transformer and the primary side of an EHV or HV system transformer, the "lower boundary" should be taken as the secondary-side terminals of the 132 kV transformer. The lower voltage

²⁹ See Chapter 3 paragraph 3.6 in relation to the reporting of incidents in Scotland.

busbars and their protection equipment at 132 kV/lower voltage substations are not included.

1.6. The "upper boundary" of the 132 kV system should be taken as the point at which ownership of the 132 kV circuit or plant becomes the responsibility of the DNO.

EHV systems

1.7. For the purposes of reporting under SLC 45, extra high voltage (EHV) includes all voltage levels above 20kV up to but excluding 132kV. The "lower boundary" of EHV systems should be taken as the supply terminals of customers supplied at EHV, and in other situations as the load-side terminals of protection equipment connected to the secondary side (lower voltage) of EHV transformers. The "upper boundary" should in general be taken as the busbar side of lower voltage switchgear of transformers whose primary voltage is 132kV or above and whose secondary voltage is EHV. If no secondary switchgear exists, the "upper boundary" should be taken as the secondary-side terminals of the 132 kV or above transformer: incidents on the system connected to the secondary voltage terminals of the transformer should be reported as EHV incidents and not as 132kV incidents.

HV systems

1.8. For the purposes of reporting under SLC 45, high voltage (HV) includes all voltage levels above 1,000 volts up to and including 20kV. The "lower boundary" of HV systems should be taken as the supply terminals of customers supplied at HV, and in other situations as the load-side terminals of the protection equipment connected to the secondary side (lower voltage) of distribution transformers respectively. Where the transformer does not have any secondary-side protection equipment, the boundary must be the bolted connection between the transformer tail and the lower voltage busbar. The "upper boundary" should in general be taken as the busbar side of lower voltage switchgear of transformers whose primary voltage is EHV or above and whose secondary voltage is HV. If no secondary switchgear exists, the "upper boundary" should be taken as the secondary-side terminals of the EHV or above transformer: incidents on the system connected to the secondary voltage terminals of the transformer should be reported as HV incidents and not as EHV or 132 kV incidents.

LV systems

1.9. For the purposes of reporting under SLC 45, a low voltage (LV) system is one that operates at a nominal voltage of 1000 V or less.

1.10. The upper boundary should be taken as the load-side terminals of the protection equipment connected to the secondary side (low voltage) of distribution transformers. Where the transformer does not have any secondary-side protection equipment, the boundary must be the bolted connection between the transformer tail and the LV busbar. The lower boundary should be taken as the points of connection associated with LV services.

LV services

1.11. For the purpose of reporting under SLC 45, LV services are defined as the service line from the LV distributing main to the DNO's protection device situated upon the customer's premises, including the joint and associated components connecting the service line to the distributing main. It should be noted that incidents on cut-outs and all wiring and equipment after cut-outs, including cut-out fuse operations, are excluded from reporting under the Quality of Service Incentive Scheme (even where this results in the operation of a fuse at the DNO's substation) and the definition of LV services therefore excludes this equipment.

Auditing and estimating the accuracy of interruptions reporting

Audit preparation

1.12. At the end of the reporting year each DNO must submit information on CI and CML at each voltage by incident and restoration stage.

1.13. Ofgem will then select a sample of 150 incidents, split between 132kV and EHV, HV and LV according to the respective contribution to CI and CML (with a minimum of 50 LV incidents). A proportion of the sample will be held back until the time of the audit, and where a DNO agrees, the entire sample will be held back.

Audits

1.14. The audits of interruption reporting accuracy for the purposes of the scheme will then involve the following steps:

Stage 1 – Calculation of MPAN accuracy³⁰

1.15. The HV MPAN accuracy will be calculated using the following formula:

$$\left(\frac{\text{Total number of primary traded MPANs assigned to true feeders at HV}}{\text{Total number of primary traded MPANs}} \right) \times 100$$

1.16. The LV MPAN accuracy will be calculated using the following formula:

³⁰ True feeders are feeders which can generate CI and CML.

$$\left(\frac{\text{Total number of primary traded MPANs assigned to true feeders at LV}}{\text{Total number of primary traded MPANs}} \right) \times 100$$

1.17. The 132kV and EHV MPAN accuracy will be calculated using the following formula:

$$\left(\frac{\text{Total number of primary traded MPANs assigned to true feeders at 132kV and EHV}}{\text{Total number of primary traded MPANs}} \right) \times 100$$

Stage 2

1.18. Ofgem's auditors will audit 50 HV and above incidents and 30 LV incidents³¹.

1.19. The auditors will then calculate the mean, standard deviation and mean plus/minus 4 standard deviations of the errors in the reported restoration stage figures.

1.20. The auditors will exclude any incidents containing outlier restoration stages (ie where the errors of any stage are outside the mean plus/minus 4 standard deviations).

1.21. The auditors will then calculate the accuracy of incident reporting for CI and CML for the 132kV and EHV, HV and LV data sets using the following formula:

$$\frac{\text{Sum of reported CI/CML for remaining restoration stages}}{\text{Sum of audited CI/CML for remaining restoration stages}}$$

1.22. The auditors will calculate the combined MPAN and incident reporting accuracies (for each of the three voltage categories) using the following formula:

$$[\text{MPAN accuracy} * \text{accuracy of incident reporting}] * 100$$

1.23. This is expressed as a percentage less than 100 using the following formula:

³¹ Where incidents that are "too difficult" to audit are substituted by a relevant spare incident.

100 - modulus[100 - combinedaccuracy]

1.24. If the 132kV and EHV accuracy results are greater than or equal to 99 per cent, the DNO will be deemed to have met the accuracy levels set out in the rigs. If not, the remaining 132kV and EHV sample will be audited at Stage 3.

1.25. If the HV accuracy results are greater than or equal to 97 per cent, the DNO will be deemed to have met the accuracy levels set out in the RIGs. If not, the remaining HV sample will be audited at Stage 3.

1.26. If the LV accuracy results are greater than or equal to 93 per cent, then the DNO will be deemed to have met the accuracy levels set out in the RIGs. If not, the remaining LV sample will be audited at Stage 3.

Stage 3

1.27. If appropriate, the auditors will audit the remaining incidents in the 132kV and EHV, HV and LV samples and recalculate the incident reporting accuracies and combined accuracies using the same method as set out in Stage 2.

1.28. If the DNO fails to meet the 97 per cent minimum 132kV and EHV level of accuracy required for the reporting of the number of customers interrupted and duration of interruptions set out in table 3.1 in chapter 3, Ofgem will make the appropriate adjustments³² to performance.

1.29. If the DNO fails to meet the 95 per cent minimum HV level of accuracy required for the reporting of the number of customers interrupted and duration of interruptions set out in table 3.1 in chapter 3, Ofgem will make the appropriate adjustments³³ to performance.

1.30. If the DNO fails to meet the 90 per cent minimum LV level of accuracy required for the reporting of the number of customers interrupted and duration of interruptions set out in table 3.1 in chapter 3, Ofgem will make the appropriate adjustments³⁴ to performance.

³² Where data is found to fail the 97 per cent minimum 132kV and EHV level of accuracy, the data will be made 100 per cent accurate.

³³ Where data is found to fail the 95 per cent minimum HV level of accuracy, the data will be made 100 per cent accurate.

³⁴ Where data is found to fail the 90 per cent minimum LV level of accuracy, the data will be made 100 per cent accurate.

Appendix 2 – The Authority’s Powers and Duties

1.1. Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority (“the Authority”), the regulator of the gas and electricity industries in Great Britain. This Appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

1.2. The Authority's powers and duties are largely provided for in statute, principally the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Act 2004, as well as arising from directly effective European Community legislation. References to the Gas Act and the Electricity Act in this Appendix are to Part 1 of each of those Acts.³⁵

1.3. Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This Appendix must be read accordingly³⁶.

1.4. The Authority’s principal objective when carrying out certain of its functions under each of the Gas Act and the Electricity Act is to protect the interests of existing and future consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the shipping, transportation or supply of gas conveyed through pipes, and the generation, transmission, distribution or supply of electricity or the provision or use of electricity interconnectors.

1.5. The Authority must when carrying out those functions have regard to:

- the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met
- the need to secure that all reasonable demands for electricity are met
- the need to secure that licence holders are able to finance the activities which are the subject of obligations on them³⁷
- the need to contribute to the achievement of sustainable development

³⁵ entitled “Gas Supply” and “Electricity Supply” respectively.

³⁶ However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.

³⁷ under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Act in the case of Electricity Act functions.

- the interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.³⁸

1.6. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

- promote efficiency and economy on the part of those licensed³⁹ under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems
- protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity
- secure a diverse and viable long-term energy supply.

1.7. In carrying out the functions referred to, the Authority must also have regard, to:

- the effect on the environment of activities connected with the conveyance of gas through pipes or with the generation, transmission, distribution or supply of electricity
- the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice
- certain statutory guidance on social and environmental matters issued by the Secretary of State.

1.8. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation⁴⁰ and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

³⁸ The Authority may have regard to other descriptions of consumers.

³⁹ or persons authorised by exemptions to carry on any activity.

⁴⁰ Council Regulation (EC) 1/2003

Appendix 3 - Feedback Questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

Andrew MacFaul
Consultation Co-ordinator
Ofgem
9 Millbank
London
SW1P 3GE
andrew.macfaul@ofgem.gov.uk