September 2000

Information and incentives project

Output measures and monitoring delivery between reviews

Final proposals

Executive summary

The Information and Incentives Project (IIP) aims to strengthen the financial incentives on companies to maintain or improve the quality of supply. In order to do this Ofgem has focused in the first year of the project on the information the electricity distribution businesses produce in particular on quality of supply. In June Ofgem published its initial proposals on the output measures to which direct financial incentives should apply, namely the number of interruptions to supply, their duration and customer satisfaction; a framework for monitoring medium term performance and the process for measuring and auditing this information.

This paper sets out Ofgem's final proposals on these issues in the light of the responses it received and additional work it subsequently carried out. In particular it specifies:

- the definitions and approach for measuring the three key outputs and supporting measures;
- the accuracy with which companies will be required to measure the number of interruptions to supply and their duration;
- a draft licence modification for collecting and auditing this information; and
- a timetable for additional work which will need to be carried out in the build up to April 2001 when companies will first be required to produce this information.

Some companies may need to introduce new or modify existing systems to meet the required level of accuracy. Where Ofgem considers that these costs were not fully allowed for in the most recent price control review, it may be appropriate to allow companies an adjustment to their regulated revenue equivalent to 50 pence per customer.

Comments are invited by 30 October 2000.

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1. Introduction

Objectives and context

1.1 The objectives of the Information and Incentives Project (IIP) relate to the distribution businesses ("the companies") of the fourteen regional Public Electricity Supply (PES) companies and include:

- striking an appropriate balance between incentives on companies to reduce costs and incentives to maintain or improve quality of supply and standards of service;
- encouraging companies to feel they are competing against each other over the period of the price control rather than merely beating a single target set by the regulator at the start of a price control period; and
- reducing uncertainty around the price control review process.

1.2 Ofgem has divided the work to achieve these objectives into two broad parts. The first part of the work has focused on improving the quality of information produced by the distribution businesses.

1.3 Good information is a key ingredient of good regulation. Companies that are well managed use knowledge as an important tool. If a regulator is not furnished with good information, a greater element of judgement is required in setting price controls, which brings with it an undesirable and unnecessary element of regulatory uncertainty. Poor information also makes the judgement of relative performance less easy for the regulator and other commentators.

1.4 This document deals with:

- establishing the measures of quality of supply and service standards appropriate for incentivisation under the IIP, on the basis of what matters to customers;
- measuring these accurately across companies and over time, for instance by specifying standards of accuracy for measurement of key data and

improvements in measurement systems and processes, and by requiring performance information to be disaggregated; and

- ensuring that short-term performance incentives do not cause medium term performance problems by establishing a framework designed to safeguard medium term performance.

1.5 This document includes conclusions on these areas and a draft licence modification which companies are required to accept in order to provide a proper basis for implementing the rest of the IIP. By accepting this licence modification, distribution businesses are accepting the requirements to measure and provide the relevant information, but are not thereby bound to accept the final IIP proposals.

1.6 The second part of the work will deal with the incentive regime itself: the evaluation of cost and the balancing of cost against delivery; the mechanism of the scheme; and the values to be used in running the scheme from April 2002 to April 2005. In respect of this period, it has already been agreed that no company will be exposed to the IIP to an amount greater than 2 per cent of its revenues. The incentive regime will be implemented by a licence modification. Companies will have the right to refuse that modification at that time and Ofgem may then choose to refer the matter to the Competition Commission. The second part of the project will get underway in October.

1.7 The IIP will be reviewed as part of the next distribution price control in 2004/5, which is expected to determine distribution revenues from April 2005.

Process to date

1.8 Ofgem has published two consultation papers and an initial proposals document as part of the IIP. The December 1999 document set out the objectives and overall timetable for the project. The March 2000 update document set out Ofgem's initial thinking on defining outputs and monitoring delivery between reviews. A public workshop was held on 4 May 2000 to provide a forum in which to discuss a number of key issues emerging from the IIP with a wide audience. A summary of the plenary session is available on Ofgem's website (www.ofgem.gov.uk).

1.9 The June 2000 document set out Ofgem's initial proposals for defining output measures and monitoring delivery between reviews. It highlighted deficiencies in the quality and consistency of measurement systems across distribution businesses and proposed measures to remedy these. An industry working group meeting with the distribution businesses and the Electricity Association (EA) was held on 24 August to discuss the detailed definitions and the methods of calculating the number and duration of interruptions to supply. Distribution businesses were given the opportunity to submit a formal response on these issues. Ofgem has also met individually with the distribution businesses in recent weeks to provide them with a chance to discuss any issues in advance of the publication of these final proposals.

PB Power report and use of consultants

1.10 PB Power has assisted Ofgem by providing technical advice in a number of areas. A report reviewing each distribution business's existing measurement systems was published on Ofgem's website in July 2000. The report concluded that there is significant inconsistency and inaccuracy in the reporting of output measures to Ofgem, although it acknowledged that some companies have made improvements in relation to performance reporting. It suggested improvements to measurement systems in the light of this review. PB Power also produced a working draft report on the definition of output measures. This was used as the basis of the industry working group meeting in August. The key definitions from the final report are set out in Appendix 3. The full report is available on Ofgem's website. PB Power has also assisted Ofgem in developing a framework for monitoring the medium term performance of network assets. This is discussed in detail in Chapter 2.

Timetable

1.11 Ofgem intends that the distribution businesses will start producing the information required for the IIP from April 2001. The draft licence modification anticipates that Ofgem will issue regulatory guidance on the information which distribution businesses are required to produce. The conclusions from this paper on the definition of output measures (and the associated PB Power report) and

on monitoring medium performance (MTP) will form the basis of the regulatory guidance. Further details on the timetable are outlined in Chapter 5.

Regulatory impact assessment

1.12 The March document explained that the costs of distribution account for a significant proportion of final bills and that the quality of service is important to all types of customers, including supply businesses. The price and quality of distribution services may also have a bearing on competition in supply.

1.13 Ofgem set out its intention to review existing arrangements with the aim of strengthening the incentives on distributors to act efficiently in delivering an appropriate quality of service, while reducing the risk of regulatory uncertainty associated with the present price control review process.

1.14 The distribution businesses need to know as soon as possible how these considerations are likely to affect the conduct of the next distribution price control review (due to be carried out in 2004 to take effect from April 2005) as well as the application of the strengthened incentives in respect of quality of supply targets, due to take effect from April 2002.

1.15 Ofgem judges that this project is likely to have a materially beneficial impact on the industry, its customers and users. It is consistent with the principal objective and duty of the Authority, as set out in the recently enacted Utilities Act 2000, to protect the interests of consumers, wherever appropriate by promoting effective competition. In addition, Ofgem must carry out its functions in the manner best calculated to further the principal objective, having regard to, amongst other things, its duty to enable licence holders to finance their licensed activities.

1.16 The March document indicated that Ofgem's direct costs for the design and implementation of the IIP were estimated at £1 million (including £0.5 million for consultants) and that the direct costs to the companies should also be relatively low.

1.17 In this document, Ofgem has a proposed a number of measures which may involve extra cost. The most significant of these are:

- a requirement on companies to measure incidents and their duration more accurately, both overall and at specific voltage levels. This requirement is likely to require all companies to implement systems which improve the level of connectivity to the their networks. Some companies have already done this. The average one-off costs of doing this for the other companies are estimated at around £0.5 million per company (for changing systems) and an additional amount equivalent to around 50 pence per customer (for populating the system with reliable data); and

- the use of customer surveys to help measure customer satisfaction and the establishment and maintenance of a proper audit function. These costs are estimated at around £0.7 million per annum across the industry as a whole, although the annual cost should fall as the scope of the audit reduces.

1.18 In the last distribution price control review Ofgem made an operating cost allowance of £3 million for each company in each of the five years of the price control (£15 million in total per company), in respect of non-operational capital expenditure to implement systems, such as those identified above. Given that many companies have already introduced such systems, they may be regarded as best practice and already allowed for within the existing price controls. However, it seems reasonable to make an additional allowance for the costs of populating the system with reliable data (i.e. 50 pence per customer). It seems appropriate to allow all companies to recover this additional cost, including those which already have the appropriate level of connectivity. In order for other companies to recover the additional costs they must comply with the requirements by April 2002.

1.19 The cost of the surveys and audit will initially be less than 3 pence per customer per year and will be recovered through distribution licence fees.

Purpose and structure of this document

1.20 In the light of the consultation process that Ofgem has undertaken so far, this document sets out final proposals on:

- the definition of output measures for the IIP and short interruptions to supply (Chapter 2 and Appendix 3);
- changes to distribution business measurement systems, including the required levels of accuracy for reporting (Chapter 3);
- the information that will be collected under the IIP (Chapter 4);
- an audit regime for the IIP (Chapter 4); and
- details of the next steps (Chapter 5).

1.21 The document also sets out a framework for monitoring medium term performance (Chapter 2), further thoughts on the use of disaggregated information (Chapter 2 and Appendix 4), and a draft licence modification for implementing these proposals (Chapter 4 and Appendix 6).

1.22 Although this document sets out Ofgem's final proposals, views are sought from all parties on:

- the detailed definition of output measures as set out in the PB Power report and summarised in Appendix 3;
- the method and level of remuneration of additional costs for those companies adopting LV circuit connectivity as set out in Chapter 3; and
- the draft licence modification as set out in Appendix 6.

1.23 Ofgem will consider the views of respondents in these areas in drawing up regulatory reporting guidance for the IIP. Any comments should be received by 30 October. They should be sent to:

Cemil Altin
Ofgem
Stockley House
130 Wilton Road
London
SWIV 1LQ

Email cemil.altin@ofgem.gov.uk
Fax 020 79321675
Tel 020 79326301

1.24 This document is available on Ofgem's website (www.ofgem.gov.uk). Any questions on this document or the IIP more generally should, in the first instance, be directed to Cemil Altin.

2. Output measures

Introduction

2.1 The June 2000 document set out Ofgem's initial proposals on defining output measures and proposed:

- a framework for considering output measures – this involved:
  - a small number of key output measures subject to direct financial incentives;
  - disaggregating output measures to improve target setting and comparisons across distribution businesses;
  - indicators to support the incentive regime, such as those covering medium term performance; and
  - issues outside the scope of the IIP.
- that the output measures subject to direct financial incentives should be:
  - the number of interruptions to supply;
  - the duration of those interruptions; and
  - a measure of customers' satisfaction with the response they receive when they contact the distribution business (or telephone response);
- that the impact of various factors on the nature of incentives, the operation of and investment in the network - such as an increase in embedded generation and guidance on environmental and social provided by the Secretary of State - should be considered at the time of a price control review; and
- that further work would be undertaken on encouraging a co-ordinated response by the distribution businesses in storms and on the treatment of short interruptions to supply.

2.2 Respondents to the June document commented on these and a number of other issues. This chapter sets out Ofgem's final proposals in the light of these comments and the views expressed by distribution businesses following the working group meeting on defining output measures in August.

The framework of output measures

2.3 Respondents to the June document broadly agreed with the scope of output measures, although a small number argued that some changes should be made. Some respondents argued that the scope of the output measures subject to direct financial incentives should be broadened to include the proposed Overall Standard (OS) of Performance on multiple interruptions and distribution charges (or prices). Others suggested that output measures relating to embedded generators and environmental issues should be included within the scope of the IIP.

2.4 Ofgem considers that the broad framework identified in the June document is appropriate. It is important to keep the number of output measures subject to direct financial incentives to a minimum. Increasing the number of output measures could unnecessarily complicate the incentive regime and interaction between measures could possibly weaken the incentives overall. The June document acknowledged the importance of price to customers but concluded that there are a number of reasons why prices should not, at this stage, be explicitly included within the incentive regime.

2.5 It would not be appropriate to include the proposed OS on multiple interruptions within the scope of output measures subject to direct financial incentives. It is not possible to conclude at this stage, as some respondents appear to have done, that the proposed OS and Guaranteed Standard (GS) on multiple interruptions will not provide adequate protection for worst served customers. The OS and GS are not due to be introduced until April 2002. As part of the next price control review it will be appropriate to consider whether the OS and GS have provided sufficient incentives to distribution businesses with respect to worst served customers. In addition, to the extent that the incentive regime improves the quality of service to customers, this should have a beneficial impact on all customers, including worst served customers.

2.6 Ofgem intends to publish a consultation paper on the Guaranteed and Overall Standards of Performance (GOSPs) in October. This document will consider the relationship between service standards (including GOSPs and the IIP) and the associated risks for a distribution business of failing to meet these standards (including financial penalties under the Utilities Act 2000 and compensation payments for failure to meet Guaranteed Standards).

2.7 The June document explained that further work needed to be done on looking at whether there needed to be additional arrangements for encouraging a co-ordinated response by the distribution businesses in storms. This included whether robust commercial multilateral arrangements could be put in place or whether there is a need for explicit arrangements for monitoring a company's response in storms. Some respondents to the June document suggested that an incentive regime that was not based on relative performance would overcome these difficulties. Ofgem considers that it is not possible, at this stage, to assess the extent to which incentives on responding in a co-ordinated way to storms will be affected by the nature of the incentive regime. It will be appropriate to take this issue forward as part of the work on developing incentive regimes. Ofgem would expect to work with customer representatives, in particular, in looking at the relevant issues.

2.8 In the light of the above considerations Ofgem confirms the broad framework for output measures outlined in the June document.

The definition of output measures

Selection criteria

2.9 Respondents to the June document broadly supported the selection criteria. One distribution business argued that the IIP should not focus on domestic customers, as business customers used a significant proportion of the electricity distributed over their network. Respondents supported the proposal to undertake further work on assessing what customers value from a distribution business.

2.10 Ofgem has chosen to incentivise those outputs which are important to both domestic and business customers, rather than introducing output measures that

are of interest to only one type of customer. Separately, Ofgem will monitor short interruptions to supply about which some business customers have expressed particular concern. This is discussed in more detail below.

2.11 The June document indicated that further work would be undertaken to gain a better understanding of what customers value from a distribution business. In considering the incentives towards improving quality of service it is necessary to understand the absolute values that customers place on different services (and improvements to these services) provided by distribution businesses. This will help identify the appropriate level of revenue that should be exposed to the IIP incentive regime in the future, which could be more than the previously announced limit of 2 per cent of regulated revenue (for the period up to April 2005). Further work on assessing the absolute values customers place on different services will be undertaken during the next distribution price control review in 2004.

2.12 Within the previously announced limit of revenue at risk to the incentive regime Ofgem considers that it is also important to obtain an understanding of the relative value that customers place on the three output measures subject to financial incentives. As part of a wider survey which is presently being undertaken by MORI, on behalf of Ofgem, customers will be questioned on the relative importance they place on reducing the number and duration of interruptions to supply and improving the quality of response they receive when they contact the distribution business. The results from the survey will be one input in deciding the amount of revenue to be exposed to each of the output measures.

Output measures

Telephone response

2.13 Respondents to the June document broadly supported the use of an event driven survey to assess customers' views on the response that they received when they contacted the distribution business. Concerns were expressed however about the practicality and robustness of the approach. In particular these concerns focused on the availability of a consistent set of customers, who have contacted the distribution business, from which to derive a sample to undertake the survey

and data protection issues. Respondents to the June document generally did not support the alternative approaches for measuring the quality of companies' customer contact, for example, by monitoring complaints.

2.14 All distribution businesses operate a telephony system that makes use of automated responses. These typically work by recognising the telephone number of the customer (excluding calls from mobile phones) who rings in and then automatically providing a recorded message specific to the area where that customer lives, although the level of detail varies across distribution businesses. Some distribution businesses operate a telephony system that is based on the British Telecom (BT) network while others operate a system that is based within their own internal network. Typically, systems on the BT network have a greater capacity for handling a larger number of calls at the same time.

2.15 It appears that some distribution businesses do not have access to telephone numbers of customers who are dealt with only by the automated system. BT, which has access to these numbers, has indicated that it is unwilling to provide the information as it considers it may breach the Data Protection Act 1998. Some distribution businesses with an automated internal system do not retain or record the telephone number of customers who do not speak to a telephone operator. The impact of these factors is that the set of customers from which to derive a consistent sample of customers for a survey is reduced.

2.16 Ofgem has contacted the Data Protection Registrar on issues regarding data protection with a view to ensuring that the arrangements put in place are compatible with the legislation.

2.17 Ofgem has also spoken to research companies and they have indicated that in order to obtain statistically robust results it is necessary to undertake around 1000 successful surveys for each distribution business each year, depending on the required level of accuracy and the nature of comparison to be made. Based on evidence provided by some companies it appears that the set of customer contacts is large enough to derive a random sample which would enable a survey to be undertaken that would provide robust results.

2.18 The set of customer contacts from which the sample will be drawn will be based only on customers that have contacted the distribution business and spoken to a telephone operator, via either:

- the freephone power outage telephone number (or its equivalent, which is printed on the back of customers' bills);
- the security and safety enquiry service telephone number (if different from the power outage telephone number); and
- the metering point administration enquiry service telephone number.

2.19 It will be necessary for distribution businesses to provide Ofgem (or its appointed agents) with either the telephone numbers of all customers that have spoken to a telephone operator on the telephone numbers outlined above or to undertake a sampling process subject to guidelines provided by Ofgem. If the distribution businesses undertake the sampling process it will be audited as part of the annual audit of the information collected under the IIP. This is discussed in Chapter 4.

2.20 The survey will need to be undertaken soon after the customer contacted the distribution business – between 5 and 10 days - otherwise customers may not recall sufficient detail of the contact with the distribution business in order for meaningful results to be obtained. It will be necessary to put in place robust arrangements to ensure that distribution businesses provide the necessary information within the required timescales.

2.21 Some distribution businesses have suggested that a component of quality in handling telephone calls is the speed with which the call is answered and that this has been a factor for some companies in choosing to use a telephony system on the BT network. Ofgem considers that this argument has merit. Distribution businesses should not be discouraged from introducing systems that can provide a faster response without jeopardising the accuracy of the information provided. Ofgem intends to measure the speed of response as an input into assessing the quality of telephone response. This will provide incentives on distribution businesses to improve the capability of their systems and recognises the improvements that some companies have already made in this area. Further

work will need to be done on defining how the speed of response is measured. This work will also provide an input into the measurement of the proposed OS on the time taken to provide a substantive telephone response which is due to be implemented from April 2002.

2.22 This approach means that the output measure of the quality of the telephone response that customers receive when they contact the distribution business will be made up of two measures, namely the quality and speed of response. These will need to be weighted appropriately in deriving the overall measure. One factor in deciding on how to weight the two measures will be the robustness of the results from the customer survey. Ofgem intends to review the results from the survey during the reporting year 2001/02 to assist in this process.

2.23 Distribution businesses will have an opportunity to comment on the questionnaire that will be used for the survey. If distribution businesses are required to undertake the sampling process the method will be agreed with the distribution businesses in February 2001 at the same time as they are asked to consider the draft survey questionnaire. Ofgem intends to tender in January 2001 for consultants so that the survey can begin in April 2001.

2.24 Telephony is an area of rapid technological development. Ofgem will want to consider, as part of the next price control review, whether the approach outlined above remains the best way of monitoring and incentivising distribution businesses to deliver high quality customer contact.

Number and duration of interruptions to supply

2.25 The June document explained that PB Power had found that up to 15 per cent of inaccuracy in reporting to Ofgem could result from differences across distribution businesses in the interpretation and application of definitions used under the National Fault and Interruptions Reporting Scheme (NaFIRS), or its equivalent. A large part of the work this year has focused on removing these inconsistencies for reporting on the IIP output measures.

2.26 Distribution businesses and other respondents broadly agreed with the use of the number and duration of interruptions to supply as output measures. In a system where financial penalties and rewards are directly linked to measurement of

outputs, it is important that consistent definitions are applied across all distribution businesses. Further work has been undertaken since June. PB Power produced a working draft report setting out consistent definitions for the outputs and for the constituent items that need to be measured in order to calculate the output measures, such as the number of customers.

2.27 The draft PB Power report was used as the basis for discussion in a working group meeting with all the distribution businesses and the EA in August. In the light of this meeting and written responses from the distribution businesses PB Power has drawn up revised definitions for the number and duration of interruptions to supply. Further details are in Appendix 3. The full PB Power report is available on Ofgem's website. The report includes a consideration of the points raised by distribution businesses in their written responses.

2.28 Ofgem intends to publish detailed regulatory guidance on reporting on output measures. This will include further details on the processes and rules to be applied for collating information on the number and duration of interruptions to supply. The timetable for producing the guidance is outlined in Chapter 5.

2.29 It is worth noting that PB Power's work in this area initially used, as a base, the guidelines produced by the EA for reporting under NaFIRS. Ofgem does not have the ability to change the NaFIRS guidance and its associated IT systems. There would be benefits for consistency in reporting and convenience for collating information from aligning, where appropriate, the definitions used for reporting on output measures to the regulator and NaFIRS. Any changes that are made will be a matter for the EA and the distribution businesses that are members of the scheme.

Short interruptions to supply

2.30 Short interruptions to supply are those that, under the existing definition, last for less than one minute. These interruptions are often called transient interruptions although this term is more appropriately related to instances when there is a voltage depression in supply. The June document consulted on whether it was appropriate to move the definition of a short interruption to supply from 0-1 minute to 0-3 minutes and to exclude interruptions falling within this band from counting towards any targets for the number and duration of interruptions to

supply. Distribution business argued that this would strengthen the incentives on distribution businesses to install auto-switching devices which take less than three minutes but more than one minute to operate. These automated devices mean that, in some instances, supply to some customers could be restored on an automatic basis from the network control centre rather than dispatching a field engineer to restore supplies manually. This would lead to a reduction in the average time a customer would be off supply following an interruption. Ofgem considers that this move will not lead to any material increase in the overall number or duration of short interruptions that customers may experience. As a consequence customers should receive an enhanced quality of supply.

2.31 Most respondents to the June document supported the proposal, including representatives of larger customers who have expressed concern at the number of short interruptions to supply. In the light of these considerations it is proposed that the definition of a short interruption to supply will be 0-3 minutes. This means that interruptions to supply of up to three minutes duration will not count towards the number and duration of interruptions to supply. Ofgem still intends to monitor closely, on an annual basis under the IIP, the number of short interruptions to supply. If the number increases significantly distribution businesses will be required to provide a detailed explanation and evidence as to why this is the case. In the light of this information Ofgem would need to decide what, if any, further action is necessary possibly as part of the next price control review or earlier if appropriate. In order to provide information on the cause of short interruptions to supply Ofgem expects distribution businesses to identify separately those interruptions caused by:

- the use of manual and remote switching to restore supply;
- the use of automated switching devices to restore supply; and
- other causes such as deliberate disconnection.

2.32 Distribution businesses have argued strongly that the move to three minutes will allow them to install automated switching devices to reduce the average amount of time a customer is off supply. This is the purpose of Ofgem's proposal. If distribution businesses do not install automated switching devices Ofgem is concerned that the move to three minutes will have reduced the scope of

interruptions subject to incentives - but not resulted in an improvement in the quality of supply to customers. While Ofgem does not want to encourage unnecessary or inefficient investment it intends to monitor the extent to which companies have installed automated switching devices as part of the next price control review. If distribution businesses have not installed auto-switching devices Ofgem will want to understand the reasons why.

2.33 In moving the definition of a short interruption to 0-3 minutes it may be necessary to rebase the targets that were set for quality of supply in the last distribution price control review. This does not mean that the targets would be strengthened or weakened, but rather they would be made consistent with the revised definition of a short interruption. This will be taken forward next year as part of the work on developing incentive regimes.

2.34 In the light of the above discussions Ofgem's proposals on measuring and incentivising output measures can be summarised in the table below.

Table 1: Network output measures and short interruptions

Output measure	**Measure and incentivise**
Number of interruptions to supply	3 minutes and above
Duration of interruptions to supply	3 minutes and above
	Measure and monitor
Short interruptions to supply	0 to 3 minutes

Disaggregated output measures

2.35 The June document explained that it was difficult to compare companies' performance on network output measures, particularly for those companies, such as London Electricity and Hydro-Electric, with significantly different networks to most other companies. This makes it difficult to be confident about setting comparable targets for the number and duration of interruptions to supply. This is of particular importance in an incentive regime based on relative performance. Even if Ofgem did not seek to introduce an incentive regime based on relative performance, it would still want to establish targets which were equally challenging for all distribution businesses. Collecting outputs on a

disaggregated basis may make this easier. Ofgem does not intend, at this stage, to set disaggregated targets for output measures.

2.36 Respondents to the June document, including the distribution businesses, were generally supportive of the need to take account of differences in starting points. Some concerns were expressed about the method and the extent to which all differences could be captured. Ofgem has developed its thinking in this area with the help of some distribution businesses that have provided data in order for initial analysis to be undertaken.

2.37 In collecting disaggregated network related output measures Ofgem is seeking to take account of inherent differences in networks that impact on performance. Ofgem does not consider that it is appropriate to disaggregate the telephone response output measure for differences in networks as this should not affect the performance of a distribution business.

2.38 Ofgem considers that one method of disaggregation would be to classify all HV circuits on the network into a small number of categories depending on the characteristics of that circuit. This method of classification has the advantage of being based on existing information that can be subject to an audit process. In addition, the information which distribution businesses collect on network related output measures is primarily based on circuits and then aggregated to give performance at a company level. The further work required for reporting additionally on a disaggregated basis is therefore minimal. The June document identified two possible characteristics or factors for disaggregation:

- *the percentage of overhead line on a circuit* – to capture differences in network design that are determined by the nature of the operating environment; and

- *the circuit length per customer* – to capture differences in customer sparsity (or population density).

2.39 It is important that the factors that are chosen have an impact on network performance and consequently the number and duration of interruptions to supply. Initial analysis by Ofgem suggests that the factors identified above do

impact on network performance. Appendix 4 shows how circuits could be classified into different categories using the two factors identified above.

2.40 One distribution business has argued that it is necessary to take account of load density in comparing companies. For example, it may be possible to use the capacity per customer of each transformer. It is for consideration whether it is necessary to include a measure of load density. One respondent suggested that population density could be assessed using the amount of customers in each postcode area. Ofgem considers that this would be difficult to audit and might raise issues about the accuracy and consistency of information on output measures collated at a disaggregated level.

2.41 The approach to starting points will be an important part of the work on developing incentive regimes. This will be taken forward next year. There may be other approaches to take account of network differences. Ofgem intends to work with distribution businesses in developing an appropriate framework. Further details on the process and timetable for the work on incentive regimes will be published in December 2000.

Monitoring medium term performance

2.42 It is important to establish an appropriate balance between short and medium term performance (MTP) of the network. Ofgem is concerned that distribution businesses may be able to achieve improvements in performance on network output measures at the expense of the MTP of the network, for example by reducing the level of replacement that is undertaken. There may also be a concern that, in future, as cost savings become harder to achieve and companies take different approaches to maintaining their networks, the risk of a decline in MTP increases. Respondents to the June document, including the distribution businesses, recognised the importance of monitoring MTP in some way. A small number of the distribution businesses suggested that Ofgem should accredit asset management policies to provide comfort to the regulator on MTP. Ofgem does not consider that this would be sufficient to ensure that MTP is being maintained. It may also inhibit developments in best practice and is inappropriately focused on regulatory monitoring of inputs.

2.43 The June document indicated that Ofgem's preferred approach was to develop a set of indicators based on an analysis of faults by asset type and to monitor trends in the performance of assets over time. Most distribution businesses already collect this information as part of the reports they prepare for NaFIRS which are submitted to the EA. PB Power and Ofgem have done some further work in this area. Ofgem intends that the broad framework for monitoring MTP will be based on the following:

- *an analysis of network reliability using fault rates and fault causes on certain asset types over time* – this builds on the information presently collected as part of NaFIRS;

- *a narrative from the distribution businesses, including an explanation of changes in trends, an evaluation of future failure rates and a report on actions taken to control any adverse trends* – particularly for worst performing assets; and

- *provision of activity based information such as the number of different asset types repaired, refurbished or maintained* – it may be useful for the regulator to collect some activity-based information, particularly if a distribution business has identified a poorly performing asset type and has put in place a replacement programme. In any event this activity based information could also be used as an input into the next price control review in 2004.

2.44 Ofgem recognises that there will be differences across distribution businesses in the way in which information on these indicators is collated. However, with these types of indicators it is likely that the trend in performance over time will be more important than the trend between distribution businesses. Ofgem will want to establish that, at the very least, individual distribution businesses are reporting consistently over time. Where appropriate, Ofgem will seek to establish consistency in the scope and definitions of the indicators that are applied to all distribution businesses.

2.45 Ofgem is not proposing that distribution businesses should operate and maintain the network to achieve a target level of reliability as this could lead to unnecessary or inefficient expenditure. Ofgem recognises that an adverse trend

in reliability for a particular asset type may not necessarily represent a deterioration in MTP. It will be appropriate to consider all the information on MTP before deciding what, if any, regulatory action is necessary at the time of a price control review or before.

2.46 Ofgem considers that the approach to MTP will evolve over time. At the next price control review it may be appropriate for distribution businesses to submit an assessment of the impact on MTP which their capital expenditure forecasts can be expected to deliver. The narrative distribution businesses submit each year would explain any differences between their expectations and outturns, along with the quantitative information outlined above. The framework for MTP would provide the regulator with a way of evaluating (and subsequently monitoring) capital expenditure requirements by looking at the outputs that the distribution business is expected to deliver. In monitoring MTP, Ofgem is seeking to provide additional comfort to consumers and their representatives that the plans submitted by the distribution businesses and any action that they take between reviews, and the final price control settlement proposed by the regulator, is consistent with ensuring the overall integrity of the distribution network for the medium and long term (i.e. for the period of the next price control and beyond).

2.47 Ofgem intends to provide further regulatory guidance on reporting on MTP. This will include further details on the asset types and fault causes that will be monitored and the narrative that distribution businesses will be expected to provide. The timetable for producing the guidance is outlined in Chapter 5.

3. Improvements to measurement systems

Introduction

3.1 The June document outlined PB Power's initial findings following the review of distribution businesses' measurement systems and suggested improvements that could be made in the short, medium and long term. This report was published on Ofgem's website in July. The medium term improvements (for introduction from April 2002) included a proposal that distribution businesses should introduce a connectivity model linking customer information to the outgoing low voltage (LV) circuit from the high voltage (HV)/LV transformer. Distribution businesses in particular, commented in detail on the proposals for improvements in measurement systems. Ofgem and PB Power have done further work in this area, including on the costs and benefits of improving measurement systems and on the required level of accuracy for reporting under the IIP.

3.2 Presently, important information (such as the number of interruptions and their duration) is not procured by the companies on a robust basis. This affects the quality of such information over time and across companies. Companies are not systematic about the level of detail to which they collect information – and in particular about the detail in which that information is directly connected to their physical networks (the 'level of connectivity'). Much is done by averaging or estimation, leading to unreliable results. Certain definitions are not standardised, and the means of averaging and estimating are themselves not consistent.

3.3 As a result, there is significant scope for error in the presentation of key performance indicators both in absolute and relative terms. PB Power estimate that companies may be as much as 30 per cent out in their reported performance (and this is borne out by the evidence of those companies who have improved their systems). Relative comparison could involve a higher margin of error.

3.4 This size of error is a serious detriment to the interests of customers. Companies may be basing their actions or strategies on false information; it hampers price regulation by creating uncertainty about the true performance of a company; and

it undermines relative judgements and hence the encouragement of relative efficiency.

3.5 Ofgem's view is that better information is key to better performance and to better regulation. Some companies have recognised this and introduced systems which are more fully automated and more able to assess the impact on customers of the performance of their networks. This better practice, which requires investment, is not being followed by all companies.

3.6 This chapter sets out Ofgem's final proposals for improvements to measurement systems and the required level of accuracy for reporting under the IIP in the light of this further thinking and the comments made by respondents to the June document and PB Power report.

3.7 Appendix 5 sets out in broad terms the present level of connectivity of the distribution businesses.

Views of respondents

3.8 Some distribution businesses have argued that they do not need to introduce LV circuit connectivity to improve the level of accuracy in reporting to Ofgem. They were particularly concerned that the benefits of improved accuracy from LV circuit connectivity could not be justified by the associated costs. Other distribution businesses have, or are in the process of, introducing connectivity to the LV circuit (or at a more detailed level). Some of these have suggested that the improvements in accuracy (and other benefits) mean that introducing LV circuit connectivity can be justified. Many other respondents to the June document, particularly customer representatives and suppliers argued strongly for the introduction of improved measurement systems, particularly on improving the level of connectivity.

Improvements to measurement systems

Approach

3.9 In coming to its decision on improvements to measurement systems Ofgem has considered a number of factors, including:

- the requirement for accurate and consistent reporting under the IIP;
- the need to put in place arrangements for measurement systems that are capable of improvement over time and of coping with changes in the nature of incidents on the network;
- other benefits of introducing improved measurement systems, including the extent to which some companies have already put in place such improvements, monitoring and administering GOSPs and other customer service benefits;
- the scale, nature, and cost of the audit that would need to be undertaken for different types of measurement systems;
- the associated costs of introducing improved measurement systems and the impact this might have on prices to customers; and
- the views of respondents to the June document and PB Power report.

Initial proposal

3.10 In June Ofgem identified a number of areas where improvements could be made, both in the short term (by April 2001) and medium term (by April 2002). These are summarised in the table below.

Table 3: Best practice improvements in the short and medium term

Timing	Elements of best practice
Short term - by April 2001	• Processes, guidelines and documentation on the collation of information under NaFIRS or its equivalent. These should be clearly understood by all relevant staff. • More formal and robust arrangements for the internal audit of data collected under NaFIRS or its equivalent, including a certain percentage of both HV and LV faults to be audited.
Medium term – by April 2002	• An interegated Network and Fault Management System automatically linked to NaFIRS IT system or its equivalent, so that a fault report can be automatically generated following confirmation of a fault on the network.

3.11 PB Power considers that these additional improvements represent best practice and a number of the distribution businesses already have these facilities in place, or are in the process of introducing them. Ofgem will, as part of its audit of measurement systems and processes, want to be satisfied that robust arrangements are in place for the collation of information. This will include looking closely at the areas identified in Table 3.

3.12 PB Power's July report also proposed that distribution businesses should be required to introduce a connectivity model down to the outgoing LV circuit from the HV/LV transformer. Four of the distribution businesses already have LV circuit level connectivity – although some changes may still be required to meet the detailed definition of LV connectivity set out in the table below.

Table 4: LV circuit connectivity

Timing	Definition
by April 2002	• The introduction of LV connectivity to the outgoing circuit from the LV/HV transformer (substation) • Customers individually identified and associated to the relevant LV outgoing circuit • This information should be updated as new information becomes available • Customers are defined on the basis of the Metering Point Administration Number (MPAN) which is unique to each metering point • The connectivity model should be dynamic (i.e. operate in real time) down to the HV voltage level. This means that as switching occurs on the HV network (i.e. the configuration of the HV systems changes) the connectivity model is able to track and update in real time the HV feeding arrangements for all customers

Required level of accuracy for the IIP

3.13 Ofgem is primarily concerned that the information that is collected from distribution businesses which is used to operate (or support) the incentive regime is accurate and consistent both over time and across distribution businesses. It is also important that accurate information is collected for monitoring and administering the GOSPs such as the proposed OS and GS on multiple interruptions. All distribution businesses agreed with these concerns.

Accuracy of reporting at the overall level

3.14 It is important that the required level of accuracy for reporting under the IIP is specified in advance. Distribution businesses should know the level of accuracy that their measurement systems will be expected to meet. The chosen level should provide the regulator with a benchmark against which a consistent and objective audit of measurement systems, and the information that is collected by those measurement systems, can be carried out.

3.15 It is important that the information on which the incentive regime is based is as accurate as possible as this will minimise the risk that financial rewards and penalties are misallocated on the basis of inaccurate information. This will permit the regulator to set incentives with more confidence. This needs to be balanced against the associated costs of achieving that accuracy and any other limitations to improving accuracy. For example, it is explained below that achieving full phase connectivity (i.e. the most detailed link between customer information and the network) cannot be justified given present costs and technology. Given these considerations it is not practical to require that distribution businesses report with 100 per cent accuracy.

3.16 Some distribution businesses have suggested that the overall level of accuracy should be 95 per cent because this is consistent with the distribution price control settlement. The final proposals on the distribution price control required an accuracy level of 95 per cent for reporting on the proposed OS and GS on multiple interruptions.[1] Work on the IIP had not started in December 1999. It is not possible to conclude that same level of accuracy for reporting under the IIP was agreed as part of the price control settlement.

3.17 The quality of measurement systems used by some distribution businesses at present, means that in any event, a step change will be required to deliver an overall accuracy level of 95 per cent or higher. Ofgem has considered that on the basis of its medium term proposals, distribution businesses should, in time, be able to achieve an overall level of accuracy in excess of 97 per cent. This will be an important consideration if, at the time of the next price control review in 2004, additional revenue is put at risk to the incentive regime.

3.18 On balance Ofgem considers that the appropriate level of reporting at the company level, from April 2002, is 95 per cent. This required level of accuracy will apply to the reporting of the number and duration of interruptions to supply.

Accuracy of reporting at the HV and LV level

3.19 PB Power and Ofgem have undertaken work to determine whether it is necessary to specify the levels of accuracy for reporting at the HV and LV level given the main objective that companies meet the overall level of accuracy of 95

per cent. This may be important given that the ratio of HV and LV customer interruptions (CI) and customer minutes lost (CML) at each voltage level differs significantly across distribution businesses. This is shown in the table below. In seeking to achieve an overall level of accuracy of 95 per cent for reporting on CMLs different companies will need to achieve different levels of accuracy of reporting at the LV level.

Table 5: CI and CML at LV voltage level

	LV – as a percentage of the total	
	Lowest (%)	**Highest (%)**
CI	3	19
CML	4	42

Notes:
1 Total includes all LV, all HV, Extra High Voltage (EHV) and 132kV and planned outages
2 Taken from 1998/99 report on "Distribution and Transmission System Performance"

Accuracy of reporting at the HV level

3.20 Ofgem considers that distribution businesses should at HV level be able to capture incidents with a high degree of accuracy - because of the existence of automatic control systems (Supervisory Control And Data Acquisition systems). These systems detect automatically incidents on the EHV and HV network. This means that distribution businesses can report accurately the vast majority of customer interruptions caused by incidents at the HV level. Most companies have connectivity models at least to the HV/LV transformer. This means they can also accurately measure and report on the level of customer minutes lost at the HV level, although the robustness of the connectivity and hence the accuracy in reporting varies across distribution businesses.

3.21 Most companies who have no connectivity are making improvements and intend to introduce connectivity models to at least the HV/LV transformer. PB Power considers that with a robust connectivity model at the HV/LV transformer distribution businesses should be able to report to an overall accuracy level of around 98 per cent for both CI and CML that are derived from incidents at the HV level and above.

[1] December 1999 "Distribution price control review: final proposals" page 35.

Accuracy of reporting at the LV level

3.22 The table below shows the level of accuracy in reporting at the LV level which is needed to meet the overall level of accuracy of 95 per cent, given different assumptions on the ratio of CML on the LV network, and an assumption of 98 per cent accuracy in reporting at the HV level.

Table 6: Accuracy of reporting

Ratio of CML HV:LV	Required level of accuracy of reporting (%)		Accuracy of reporting at company level (%)
	HV	LV	
80:20	98	83[2]	95
60:40	98	90.5	95

Notes:
1 Assumes accuracy of reporting at HV, EHV and 132 kV and planned outages are equal
2 Calculated as (0.98*0.8) + (0.83*0.2) = 0.95

3.23 Accuracy of reporting at the LV level may be harder to achieve and distribution businesses have in general made less effort to report accurately at this level as the impact of faults at the LV level on customers is less in aggregate than the impact of faults at the HV level. The proportion of CML on the LV network has tended to rise over time as distribution businesses increase the level of automation, and therefore reduce the level of incidents, on the HV network. This is a trend which may be expected to continue in the future, although the ratio of CML in any particular year may be influenced by other factors including weather. PB Power's work on existing measurement systems suggests that there is likely to be greater under-reporting of the impact of LV faults on CI and CML than at the HV level.

3.24 The measurement systems that distribution businesses would have to put in place at the LV level to meet the overall level of accuracy of 95 per cent is likely to differ. For example, a distribution business would not necessarily need to introduce LV circuit connectivity to meet a LV accuracy level of 83 per cent, whereas a distribution business that needs to meet a LV accuracy level of over 90 per cent would probably need a robust LV circuit connectivity model

3.25 Ofgem considers that it is important to ensure that the arrangements that are put in place now are robust to developments over time. This is particularly important if, in future, more revenue is put at risk to the incentive regime.

Ofgem is concerned that as the proportion of HV faults falls, in part because of the strengthened incentives which the regime themselves will create and as a result of other improvements in measurement, some distribution businesses will not be able to meet the overall level of accuracy of 95 per cent. Companies will then be required to make changes in measurement systems which will take time and could delay their inclusion in the incentive regime. It may also result in companies incurring stranded costs.

3.26 Further, Ofgem considers that a minimum level of accuracy at LV level will provide an additional protection for individual customers in terms of the service that they receive. This is considered in more detail in the section below on benefits.

3.27 It should be noted that it is not possible to achieve the same level of accuracy in reporting at the HV and LV level, particularly in the absence of full LV section and full phase connectivity. This is because at the LV level it will be necessary for distribution businesses to estimate the number of customers affected by LV section and phase level incidents. Customers are typically connected to one of three phases and as such distribution businesses would have to estimate how many customers had been affected by an incident at this level (in most cases by dividing the number of customers on the circuit by three). This means that, without full phase connectivity, the level of accuracy in reporting at the LV level cannot be as high as that at the HV level.

Audit

3.28 Ofgem has explained the importance of basing the incentive regime on accurate and consistent information. This is a concern that is shared by all the distribution businesses. In order to satisfy itself that this is the case Ofgem will undertake an audit of measurement systems and processes and the data that is required by under the IIP. The arrangements for audit are set out in Chapter 4. Differences in measurement systems at the LV level could have an impact on the amount of work and hence the cost of the audit needed to verify the accuracy of the data. Consequently, Ofgem is concerned that those distribution businesses with a LV connectivity model may be inadvertently disadvantaged by being able to provide information which is more easily audited.

Proposal on accuracy of reporting

3.29 In the light of all these considerations Ofgem proposes that all distribution businesses will be required to meet a minimum level of overall accuracy of 95 per cent and a minimum level of accuracy of 90 per cent at the LV level. This is summarised in the table below.

3.30 PB Power considers that in order to achieve the level of accuracy at the LV level distribution businesses will need to introduce a robust connectivity model down to the LV circuit level.

Table 7: Required level of accuracy for reporting

Output measure	Minimum overall level of accuracy (%)	Minimum LV level of accuracy (%)
Number of interruptions to supply	95	90
Duration of interruptions to supply	95	90
Short interruptions to supply	It will be necessary as part of the reporting process for distribution businesses to indicate the level of accuracy they have achieved in the reporting of short interruptions to supply. Ofgem intends, as part of the annual audit process, to review the measurement systems used. Ofgem will consider as part of the next price control review whether to require a common level of accuracy of reporting on short interruptions to supply.	

Other benefits of LV circuit connectivity

3.31 In the course of this work a number of other benefits have been identified as a result of improving the level of connectivity.

GOSPs

3.32 Full phase connectivity would provide very detailed information on where a particular customer is connected to the network. This would provide accurate information on when, and for how long, a particular customer was off supply. This would be of particular benefit for the introduction of automatic payments under GS2 and for monitoring performance against the proposed OS and GS on

multiple interruptions. As discussed above this would involve significant costs which would appear to outweigh the associated benefits. Introducing connectivity to the LV circuit level will provide significantly more detailed information, than presently exists, on where customers are connected to the network. This would provide better information for monitoring and administering the OS and GS identified above but for a significantly lower cost than full phase connectivity. This would be beneficial for customers, the regulator and the distribution businesses. For example, there would be more accurate information available on when a customer was entitled to a compensation payment under the proposed GS on multiple interruptions. This would further protect customers so that they receive payments that are due to them. It also reduces the possibility of distribution businesses making payments in error.

Customer service benefits

3.33 There could also be additional benefits from improving the level of connectivity in terms of the level of customer service that distribution businesses provide. These include:

- enhanced restoration of supply as customers off supply are identified more readily. This may be of particular importance when there are multiple incidents in close proximity;
- improved customer information – distribution businesses would have more accuracy on the linkage between customer information and the network. This would mean that it would be easier to identify accurately which customers need to be notified of a pre-arranged interruption to supply for scheduled maintenance or other repairs to the network;
- more detailed information can be provided to customers when they contact the distribution business following an interruption to supply, including on automated messages, which is of particular concern to customers; and
- better informed investment decisions – if distribution businesses know more about the performance of their network and the impact that this has

on customers, this could lead to better informed investment decisions, for example on worst served customers.

3.34 While some of these benefits could accrue with an HV/LV transformer model of connectivity, the more detailed the information that a distribution businesses has available on the link between customer information and the network, the greater the benefits that would be realised.

3.35 One distribution business has also indicated that introducing LV circuit connectivity has enabled it to improve the level of efficiency within their business, particularly in areas such as incident management and better co-ordination of field teams.

Evaluating the costs of connectivity

The costs of LV circuit connectivity

3.36 The changes required by companies to introduce LV circuit connectivity, and consequently the associated costs depend on their starting positions and the approach that is taken to developing their information systems.

3.37 Distribution businesses have argued that the costs of introducing LV circuit connectivity are significant ranging from around £2 million to £5.4 million in one-off. Some distribution businesses have also argued that there would be an ongoing cost of updating the connectivity model for new or improved information on the location of customers on the network. One distribution business estimated the ongoing costs at £0.25 million per annum. Some distribution businesses put forward cost estimates that included improvements that would not be necessary for, or went beyond, the introduction of LV circuit connectivity. For example, one distribution business included costs relating to the introduction of a geographic information system (GIS) which provides a geographic representation of the network in a computer based model. The introduction of GIS is not a requirement for LV circuit connectivity. As such, it is not appropriate to attribute these costs directly to a requirement to introduce LV circuit connectivity.

3.38 It is important to consider these costs in the light of improvements that distribution businesses are already making to their measurement systems. Most

companies have or are implementing (or indeed improving) Fault Management Systems (FMS) – the systems that are used to manage faults on the distribution network. A significant amount of expenditure has already been committed by distribution businesses to fund these projects. It is not appropriate therefore to attribute these costs directly to introducing LV circuit connectivity. It is important to focus on the additional costs that are incurred. Some distribution businesses have argued that the cost of populating the LV connectivity model is high because of poor mains records. Distribution businesses have a statutory duty under the Electricity Supply Regulations (regulation 36) to maintain up to date mains records. It would not be appropriate to attribute all of these costs to the introduction of LV circuit connectivity.

3.39 PB Power has done further work on estimating the costs of introducing LV circuit connectivity. These costs can be split into two main areas:

- fixed costs associated with IT systems, such as extending the functionality of existing FMS; and
- the costs of data capture which are driven by the number of customers.

3.40 A number of the distribution businesses already have FMS that have functionality for LV circuit connectivity while others will need to extend their systems to accommodate LV circuit connectivity. Some distribution businesses are in the process of upgrading or implementing FMS. PB Power has spoken to suppliers of FMS who have indicated that the costs of extending the functionality of FMS to accommodate LV circuit connectivity are around £0.25 million, although this figure may vary across distribution businesses depending on the nature of their existing systems. There will also be costs associated with setting up IT systems for the data capture. PB Power has estimated these costs at around £0.25 million.

3.41 The remaining costs of introducing LV circuit connectivity relate to the population of the connectivity model. These costs are mainly associated with identifying where customers are connected to the network and then transposing this information into the FMS. There may be additional costs for some distribution businesses in order to reconcile their existing information on customers to the Metering Point Administration Number (MPANs) which is a

unique number for each metering point. This will ensure that the definition of a customer is consistent across distribution businesses. Some distribution businesses, which will not be sharing a database with the supply businesses following the formal separation of distribution and supply activities (as required by the Utilities Act 2000), have or are already in the process of undertaking this reconciliation. PB Power has estimated that the total costs of populating the LV connectivity model including the reconciliation to MPANs is around £0.50 per customer. This will vary across distribution businesses depending on the approach that they take to populating the database and the accuracy of their existing records. The table below summarises the estimated set up costs for introducing connectivity across the industry as a whole. The table estimates total set up costs across the industry at less than £1 per customer.

Table 8: Breakdown of the estimated set up costs of introducing LV circuit connectivity

Changes required to introduce LV circuit connectivity	**Estimated costs**
Average fixed IT costs	£0.5 million
Total fixed costs across industry[1]	£7 million
Average costs of populating LV connectivity model	£0.50 per customer
Total costs across industry[2]	£14 million
Total costs	£22 million
Average total cost per customer	£0.80 per customer

Notes:
1 Calculated as £0.5m for each of the distribution businesses
2 Calculated as £0.50 for each customer (approximately 27.6 million customers)

The context of the costs

3.42 These costs are also small in relation to the amount of regulated revenue that distribution businesses recover from use of system charges, and the amount of revenue that could be put at risk each year to the incentive regime. For example, Ofgem estimates that the costs of introducing LV circuit connectivity will represent around one per cent of the revenue that distribution businesses are forecast to collect from customers in 2002/03 under the existing price controls.

3.43 Under the existing distribution price controls each distribution business has been allowed £3 million of operating costs for each year of the price control (£15 million in total) for improvements in asset management IT systems. The one-off (IT) costs of introducing LV circuit connectivity are less than 5 per cent of this allowance. Ofgem considers that the IT costs of introducing LV circuit connectivity could be funded by the existing allowance.

3.44 Ofgem considers that it may be appropriate to make a one-off allowance for the costs associated with populating a LV connectivity model. Based on Table 8 this would be in the order of £0.50 per customer or around £14 million for the industry as a whole. This allowance would be made to all distribution businesses, including those that have already introduced LV circuit connectivity. In effect, all distribution businesses would be allowed to recover an additional £0.50 per customer from distribution use of system charges for one year. To the extent that there may be ongoing costs associated with maintaining an LV connectivity model this would be considered at the time of the next price control review in 2004.

3.45 The actual method of recovering the allowance needs to be considered further. It would not be appropriate for distribution businesses to recover the allowance from customers and then subsequently to delay the introduction of LV circuit connectivity. This could have implications for a company's participation in the incentive regime. It may be appropriate for the allowance to be recovered over two years (2001/02 and 2002/03). Ofgem intends to review the progress that distribution businesses are making towards improving measurement systems during 2001/02. If a distribution business is not making satisfactory progress then it is for consideration whether it should be allowed to recover the allowance from customers.

The costs and benefits of full phase connectivity

3.46 Ofgem considers that, at this stage, particularly given present technology, the costs of achieving full phase connectivity (i.e. knowing precisely for each incident which customers have been affected and for how long) are greater than the benefits that would be realised. This does not mean, that in the future, the introduction of full phase connectivity should be ruled out. If circumstances

change it will be appropriate to look again at the available evidence. For example, if a significant proportion of distribution revenue was put at stake to the incentive regime it may be desirable to further improve the level of accuracy in reporting. Alternatively the costs of achieving full phase connectivity may change as a result of new or improved technology, such that it becomes cost effective to require it.

Ofgem's final proposal

3.47 Ofgem proposes that companies should be required to raise their overall accuracy of reporting to 95 per cent for the number and duration of interruptions to supply. Further, for several reasons including the additional protection for individual customers, companies will be required to raise their level of accuracy of reporting of LV performance to 90 per cent.

3.48 Ofgem believes that these levels of accuracy are appropriate in the context of the objectives of the IIP and also reflect present best practice. They are consistent with a level of connectivity at the outgoing LV circuit. Companies are free to choose how they meet the targets set out above. However, if all companies choose to implement LV outgoing circuit as the basis of their level of connectivity, this will aid regulatory consistency and make the audit process more objective and considerably cheaper.

3.49 In recognition of this and the investment required, it may be appropriate to make a further allowance for companies to implement systems which permit LV circuit connectivity. This allowance would be paid to all companies who had achieved such connectivity in time to start recording information to the new required levels of accuracy from April 2002 (including those who have already made that investment).

Implementation

3.50 Distribution businesses will be expected to have the necessary measurement systems in place by April 2002 for delivering the required levels of accuracy. During the course of 2001/02, Ofgem will want to understand what changes distribution businesses have made, or are planning to make, to improve their measurement systems, including the timetable for doing so. Ofgem will want to

make sure that distribution businesses are making adequate progress towards meeting the timetable for improving their measurement systems.

3.51 If any distribution business subsequently fails to meet the required level of accuracy, in the specified timetable, Ofgem expects to take the necessary action including imposing financial penalties for a breach in a licence condition, as set out in the Utilities Act 2000 or an adjustment within the incentive regime. Ofgem's initial view is that the cost to a distribution business for not being able to provide accurate information should be at least as great as the financial payment of the least successful company under the incentive regime. If this is not the case, distribution businesses who think they might not do well in the incentive regime will always have the incentive to submit inaccurate information, rather than working towards improving the quality of service it delivers to its customers.

4. Monitoring framework

Introduction

4.1 The June document highlighted a number of concerns with the present arrangements for collecting information from distribution businesses. Ofgem indicated that rather than introduce a completely new set of reporting arrangements it intended to build on the information that is already collected and address the concerns that were highlighted on an individual basis.

4.2 In the light of responses to the June document this chapter sets out Ofgem's further thinking on the appropriate reporting arrangements for IIP, including arrangements for the audit, implementation and publication of the information template. It also considers the link between the IIP reporting framework and the other information that is collected on a regular basis. Ofgem will need to decide as part of the work on incentive regimes the appropriate way of making this information available.

The IIP reporting framework

4.3 It is intended that information will be collected in three main areas:

- performance on the output measures, namely:
  - the number of interruptions to supply, including at a disaggregated (circuit) level;
  - the duration of interruptions including at a disaggregated (circuit) level;
  - telephone response – to include the stated telephone answering speed in all circumstances. Ofgem will also undertake a survey of customers views in this area as discussed above;
- the number of short interruptions to supply disaggregated by cause;
- information required for monitoring medium term performance (MTP), namely:

- fault rates and fault causes on certain asset types;
- supporting narrative from the distribution business; and
- other activity-based information.

4.4 Ofgem intends to collect this information on an annual basis, although for the first year of reporting (from April 2001) it may be appropriate to collect information on performance against the number and duration of interruptions to supply after 6 months. This could help in developing the incentive regime which will implemented from April 2002.

4.5 It was indicated above that Ofgem intends to produce detailed regulatory guidance on the way in which information should be collated under the IIP. Ofgem would expect to issue this guidance on an annual basis around January to apply for the following reporting year from April. Ofgem recognises that any significant changes to the scope or form of the information that it requests from the distribution businesses could not only increase the regulatory burden but also the perception of regulatory risk. It is Ofgem's intention to change the scope and form of the information it requests as infrequently as possible, consistent with Ofgem carrying out its duties as specified by the Utilities Act 2000.

4.6 Ofgem considers that distribution businesses should be able to submit the information required under the IIP soon after the end of the financial year. This is because the information would be collated by the distribution businesses on an ongoing basis. Ofgem will undertake an audit of the information after it has been submitted. The arrangements for audit are discussed below.

4.7 In the light of these considerations an indicative timetable for reporting under the IIP up to and including the financial year 2003/4 is shown in the table below.

Table 9: Indicative timetable for reporting under the IIP

Financial year 2001/02	**Output**
November 2000	Ofgem issues draft regulatory reporting guidance for financial year 2001/02 for comment.
January 2001	Ogfem issues final regulatory reporting guidance for financial year 2001/02.
April 2001	Reporting for financial year 2001/02 begins.
September 2001	Distribution businesses submit 6 month report on performance on network related output measures.
end April 2002	Distribution businesses submit required IIP information.
May – July 2002	Ofgem undertakes audit of IIP information.
Financial year 2002/3	
April 2002	Reporting for financial year 2002/03 begins.
end April 2003	Distribution businesses submit required IIP information.
May – July 2003	Ofgem undertakes audit of IIP information.
August 2003	Possible settlement of incentive regime (subject of further consultation).
Financial year 2003/4	
As for 2002/03	As for 2002/03.

Audit, publication and implementation

Audit

4.8 The June document outlined Ofgem's preferred approach to audit for information collected under the IIP. Under this approach the regulator, in the first instance, appoints and employs the auditors. Rather than looking at individual distribution businesses the auditors will be responsible for looking at measurement issues across all distribution businesses. Ofgem's preference for this approach is driven by the need to establish, as soon as possible, consistency in the information that is reported to the regulator. There was strong support for this approach from almost all respondents to the June document. Ofgem also considers that there are advantages in retaining one set of auditors to look at all the information collected under the IIP information template.

4.9 There are two broad types of audit that will be required for the first two years of reporting under the IIP. An audit of:

- processes and measurement systems to satisfy the regulator and companies that the measurement systems the distribution businesses

have in place are capable of delivering the required level of accuracy; and

- a random sample of the data submitted in the IIP information template to satisfy the regulator and companies that on an ongoing basis the affect of network performance on the number and duration of interruptions to supply, and short interruptions is being recorded accurately. This audit will also look at the accuracy of disaggregated information.

Audit of processes and measurement systems

4.10 The audit of measurement systems and processes is important as distribution businesses will be making improvements in order to meet the required levels of accuracy for reporting discussed in Chapter 3. It is important to ensure that these improvements will deliver the required level of accuracy.

4.11 The broad form of this audit would follow the work that PB Power has already undertaken as part of the IIP on reviewing the measurement systems of the distribution businesses. In effect, this part of the audit would be a repeat of the work that has already been carried out as an input into Ofgem's proposals on measurement systems and processes and the required level of accuracy for reporting. The audit would also need to consider documentation, guidelines and internal audits that distribution businesses have put in place, as outlined in Table 3 in Chapter 3.

4.12 The quality of the telephone response is being measured using a combination of output measures, namely the speed of response and a survey of customers views of the service that they received when they contacted the distribution business. Depending on the way in which the speed of response is measured it may be necessary to undertake an audit of the telephony systems of the distribution businesses. It may also be necessary, if distribution businesses undertake the sampling process of customers for the telephone survey, to audit their approach to ensure that it follows Ofgem's guidance.

4.13 It may also be necessary to audit the information that is used to classify circuits as part of the disaggregation process, for example the percentage of overhead line on a particular circuit.

Audit of data

4.14 In addition to the audit of processes and measurement systems it will be necessary to undertake an audit of a random sample of the data that is collected as part of the IIP, in order to decide whether the information is accurate and has been collected on a basis which is consistent with the reporting guidelines. For the network related output measures one input to the audit will take the form of an incident "walk-through" similar to that undertaken by PB Power in producing their initial report on measurement systems. Distribution businesses will also have to explain in detail any assumptions underlying their measurement systems.

4.15 Ofgem intends to tender for auditors for the IIP around March 2001. This will enable an audit of processes and measurement systems to be undertaken during the financial year 2001/02.

Publication

4.16 The June document indicated that Ofgem is committed to increasing the level of transparency in the regulatory process and as part of the IIP it will seek to meet this objective. Ofgem's view is that all the information that is collected under the IIP information template will be made publicly available in some form, subject to an appropriate consideration of issues such as commercial confidentiality and Ofgem's duties under the Utilities Act 2000.

Implementation

4.17 It is Ofgem's intention to put in place a specific licence condition for the collection of information under the IIP and for arrangements relating to the audit of that information. Ofgem considers that this will provide comfort to the distribution businesses about the framework for collecting information and the audit arrangements and the process for making changes over time. This should reduce the perception of regulatory risk.

4.18 A draft of the licence modification is in Appendix 6. Distribution businesses and other interested parties will be given until 30 October to comment on the licence modification. In the light of these comments, Ofgem will issue a Section 11 notice on the proposed licence modification. This is a statutory 28 day

consultation which must be carried out before the proposed licence modification can be implemented. The licence condition will initially be included in the Public Electricity Supply (PES) licence subject to the agreement of consultees.

4.19 Ofgem will be consulting in October, on behalf of the Secretary of State, on the final draft standard distribution licence which will be required under the Utilities Act 2000. The IIP licence condition which is introduced into the PES licence will subsequently be inserted in Section C of the standard distribution licence. This means that it will apply only to the ex-PES distribution businesses and not other holders of a distribution licence. Following the consultation period Ofgem intends to present the standard distribution licences to the Secretary of State early in the new year.

Monitoring delivery between price reviews

4.20 Ofgem collects information from distribution businesses on a regular basis in a number of forms, including:

- *Quality of Supply reports* – which are published by the distribution businesses on an annual basis and contain detailed information on the quality of supply delivered by distribution businesses. Ofgem has recently produced a draft update on the 1995 guidance for quality of supply reporting which has been sent to the distribution businesses, Electricity Consumer Committees (ECCs) and the Gas and Electricity Consumer Committee (GECC) for comment;

- *Regulatory accounts* – which are submitted on an annual basis and provide accounting information such as profit and loss accounts and balance sheets. Ofgem has recently published a consultation paper on a review of regulatory accounts. For the distribution businesses the key issue is drawing up revised accounting guidelines that will improve the consistency between the regulatory accounts and the price controls;

- *Condition 6 (formerly Condition 9 of the PES licence) reports* – these reports provide information on network performance including against the quality of supply targets underlying the price controls. Information

that is submitted as part of the IIP and on performance against the GOSPs is not necessarily sufficient for the purpose of reporting under Condition 6. In drawing up the regulatory guidance on the IIP, Ofgem will seek to remove any duplication of information between Condition 6, the IIP and the GOSPs. Where appropriate Ofgem would like to see consistent definitions being applied to information provided under the IIP, Condition 6 and the GOSPs;

- *Audited price control returns* – which provide information on, amongst other things, the revenue recovery of the distribution business against the assumptions underlying the price controls; and

- *Guaranteed and Overall Standards of Performance* – which provide information on performance against the GOSPs scheme, published by Ofgem in an annual report on Customer Services. Under the Utilities Act 2000 responsibility for collecting this information will remain with Ofgem although the GECC will have responsibility for publishing the information.

4.21 As part of the work to be carried out next year on incentive regimes, Ofgem will also consider the most appropriate format for reporting on the performance of individual distribution businesses within the incentive regime. It may also be appropriate to consider whether there are benefits from producing an annual report that monitors delivery against the price control, in terms of costs, revenue, quality of supply and performance under the IIP incentive regime.

5. Next steps

5.1 It is important to outline the next steps between now and April 2001 when information for the IIP will be collected for the first time. The main areas to consider are the process and timing for:

- modifying the licences of the distribution businesses;
- drawing up detailed regulatory guidance for the reporting of output measures, for monitoring medium term performance and collecting disaggregated information; and
- consulting on the form of a questionnaire to assess the views of customers of the response they receive when they contact a distribution business by telephone.

5.2 The indicative timetable for taking these areas of work forward is outlined in the table below.

Table 10: IIP next steps to April 2001

Area of work	Work	Timing
Modifying licences	• Consult on draft licence condition • Ofgem to review responses • Section 11 notice • licence modification implemented in PES licence • licence modification included in Section C of the standard distribution licence	• To 30 October 2000 • late November 2000 • January 2001 • April 2001
Regulatory guidance on output measures, MTP and disaggregated information	• Ofgem produce draft regulatory guidance • Consultation period on regulatory guidance • Ofgem issues regulatory guidance	• Mid November 2000 • Ends mid Decembr 2000 • January 2001
Telephone response	• Ofgem issues terms of reference for consultancy support • Consultation on form of survey questionnaire	• Mid January 2001 • Mid to end February
Audit	• Ofgem issue terms of reference for appointment of auditors	• March 2001
Reporting under IIP		• Begins 1 April 2001

5.3 In addition to this work, Ofgem expects to publish an initial consultation paper on issues associated with the framework for the output based incentive regime in December 2000. This will set out in detail the timetable and process for taking the work forward on incentives.

Appendix 1 Summary of responses to June document

1.1 29 responses were received to the June document on output measures and monitoring delivery between reviews – 12 PESs (covering the 14 distribution businesses), 6 ECCs, the National Electricity Consumers Council (NECC) and 10 others.

The framework of output measures

1.2 Respondents were broadly supportive of the scope of the output measures, although a small number indicated that some changes should be made. Some respondents suggested that the scope of the output measures subject to direct financial incentives should be broadened to include the proposed Overall Standard (OS) of Performance on multiple interruptions and distribution charges (or prices). Others indicated that output measures relating to embedded generators and environmental issues should be included within the scope of the IIP.

Output measures

1.3 Respondents were broadly supportive of the selection criteria for output measures. One respondent argued that the criteria were too limited. They suggested that output measures should reflect 'what customers actually value and what they would value if it were obtainable'.

1.4 One distribution business argued that the IIP should not focus only on domestic customers as business customers used a significant proportion of the amount of electricity distributed over their network.

1.5 There was support of the proposal to undertake further customer research to understand better what customers value from a distribution business. One respondent indicated this work should feed into the next price control review in 2004.

1.6 There was general support for the output measures to be subject to financial incentives. Some respondents indicated they were too narrowly defined and suggested that the OS on multiple interruptions should be included to further protect the interests of worst served customers. One distribution business

expressed concern with basing the definition of the IIP output measures on those used in NaFIRS.

1.7 Respondents generally supported the use of an event driven survey to seek the views of customers on the response that they received when they contacted the distribution business. A few respondents expressed concerns about the practicality and robustness of the approach. One respondent disagreed with the use of only an event driven survey. It suggested looking instead at the speed of telephone response.

1.8 There was concern from some distribution businesses about using prices to adjust starting positions. They argued that price was a function of many different factors, some of which were outside the control of the company. Other distribution businesses suggested that price should be included in some way, either within the incentive regime or to adjust starting positions.

1.9 Respondents were broadly supportive of the need for adjusting starting positions. Some respondents indicated concern about the method and the extent to which all differences could be captured. One distribution business indicated that it might not be possible to develop a method that explained both differences in performance and that was meaningful to customers. Some respondents favoured using a decision tree approach to classify circuits. One ECC indicated that disaggregated output measures should not be included in the incentive regime. It argued that this would cause additional concerns with regard to the quality of supply to worst served customers.

1.10 There was strong support from ECCs for a national strategy for storms and for closely monitoring a company's response to storm damage. One ECC suggested that the regulator should set out emergency situation obligations as this would create a level playing field and avoid perverse incentives. ECCs generally agreed that there was no need for additional incentives relating to the sharing of best practice.

Measurement Systems

1.11 Respondents were broadly supportive of the short term improvements to measurement systems, but distribution businesses particularly expressed concern

at the proposals for medium and long term improvements. Several of the distribution businesses argued that a detailed level of connectivity could not be justified by the small improvement in accuracy of reporting that would accrue compared to the costs that would be incurred from introducing the improvements.

1.12 One distribution business indicated that the introduction of connectivity to the outgoing LV circuit appeared illogical. They argued that it would be more appropriate to go to the most detailed level of connectivity in one step. Some other respondents, including suppliers and customer representatives indicated strong support for introducing a more detailed level of connectivity. Some respondents suggested that the long term improvements in measurement systems should be achieved in a shorter timescale.

1.13 Most respondents agreed that it was necessary to monitor medium term performance (MTP) in some way and that it would be appropriate to develop a set of indicators based on an analysis of faults by asset type and to monitor trends in the performance of assets over time. A number of respondents did not support the use of an accreditation scheme for asset management policies, although some distribution businesses supported this approach.

1.14 Respondents were supportive of the proposal to broaden the definition of a short interruption to include all those of up to three minutes. Distribution businesses argued that this would provide incentives to introduce more automation on the LV network which would improve the quality of supply to customers. One distribution business indicated that a move to three minutes needed to be considered in the light of changes that would be required to customer information systems and the definitions of the output measures to be used in the incentives regime. One ECC indicated that there could be a risk of creating a perverse incentive on companies to opt for one longer interruption rather than three or four short interruptions. It suggested that consumer concerns over short interruptions were decreasing as new appliances provided protection against short interruptions.

The monitoring framework

1.15 Respondent generally supported the mode of audit where the regulator appoints and employs the auditor to look at all companies. One respondent argued that it might, in time, be possible to the let the distribution businesses appoint their own auditors as the consistency in reporting was improved. One distribution business argued that companies should appoint the auditors for information collected under the IIP. It suggested that the audit arrangements for IIP should not be separated from the audit arrangements for other information (such as the regulatory accounts) and that the audits could be undertaken according to guidelines that would be specified by the regulator.

1.16 Respondents supported increasing the level of transparency in the reporting arrangements, although distribution businesses indicated that consideration would need to be given to issues of price sensitivity and commercial confidentiality. One respondent commented that any information published needed to be clear and simple to understand.

1.17 Respondents generally supported the proposed review of Guaranteed and Overall Standards of Performance scheme. Several suggested that duplication between the GS, OS and the IIP should be avoided, although where possible consistent definitions should be used.

Appendix 2 List of respondents to June document

Distribution Businesses

East Midlands Electricity
GPU Power UK
Infralec
London Power Networks
Northern Electric Distribution Limited
NORWEB Distribution
SEEBOARD
ScottishPower
Scottish & Southern Energy Plc
TXU Europe Distribution
Western Power Distribution
Yorkshire Electricity

ECCs and other consumer representatives

Eastern ECC
Midlands ECC
North East ECC
North West ECC
South East ECC
Yorkshire ECC
National Electricity Consumers Council

Major Energy Users' Council

Others

24Seven
Adams Harper Ltd
BG Transco Plc
British Gas Trading
GE Harris Energy Control Systems UK Ltd
Innogy
OFWAT (Office of Water Services)
Peak District - National Park Authority
Smallworldwide Plc

Appendix 3 Definitions of output measures and short interruptions to supply

Introduction

3.1 This Appendix outlines the broad definitions for the network related output measures and short interruptions to supply. Where possible Ofgem has tried to ensure that the definitions that will be applied will lead to consistent reporting across distribution businesses. Further details on the definition of output measures are in PB Power's report which is available on Ofgem's website (www.ofgem.gov.uk).

Defining output measures

The number of interruptions to supply

3.2 The number of interruptions to supply will be defined as follows:

The number of customers interrupted per 100 connected customers, i.e.

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

3.3 As discussed in Chapter 2, the definition of an incident for the purpose of counting towards the number of interruptions is an incident lasting more than 3 minutes.

3.4 Distribution businesses have argued that it is appropriate to exclude re-interruptions to supply within the timeframe a particular incident remains open (or active). This is because it is sometimes necessary to re-interrupt customers as part of the process of restoring supply permanently. Ofgem considers that this argument has merit. Distribution businesses should not be discouraged from restoring supply permanently as soon as possible. In addition, it should reduce the inconsistencies that presently exist across distribution businesses in reporting to the regulator. It may also be appropriate to adopt a similar definition for assessing performance against the proposed multiple interruption OS and GS which are due to be implemented from April 2002. This would ensure

consistency in comparing performance under the IIP and against the GOSPs scheme in this area. Nonetheless, Ofgem considers that customers should not experience an unnecessarily high number of re-interruptions during an incident. It intends to monitor closely the proportion of re-interruptions to total incidents on an annual basis. If these are seen to increase significantly, particularly against a company's own track record, Ofgem will need to consider what further action is necessary. This may include the use of a within range adjustment to regulated revenue at the time of the next price control or a review of the treatment of re-interruptions under the IIP incentive regime. In addition, if a customer is re-interrupted, for example for repair work, after supplies to all customers have been restored for a period of three hours this will be treated as a new incident, regardless, of whether the existing incident has been closed. Ofgem does not want to discourage the use of mobile generators to maintain supply to customers while faults on the network are being repaired. As a consequence the three hour limit will relate only to network related re-interruptions to supply.

The duration of interruptions to supply

3.5 The duration of interruptions to supply will be defined as follows:

Average customer minutes lost per connected customer, i.e.

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

3.6 The definition of the duration of interruptions to supply will include the customers minutes lost for all restoration stages. This means that if, as part of an incident, customers' supply is restored for a certain period of time (restoration stage), the distribution business will receive recognition in the count of the customer minutes lost, i.e. the total customer minutes lost will be reduced by the length of the restoration stage. This is an area of reporting that is particularly inconsistent across distribution businesses, because of the flexibility that presently exists within the NaFIRS scheme and its related IT systems. Ofgem considers that this level of flexibility is not acceptable under an incentive regime based on this information. As a consequence a consistent definition will be used by all distribution businesses for reporting under the IIP.

3.7 There will be a minimum restoration period of three minutes before distribution businesses receive credit against total customer minutes lost. Some distribution businesses have argued that the adoption of any time limit is arbitrary. Ofgem considers that a minimum period of three minutes will ensure consistency between this output measure and the definition of short interruptions to supply.

Short interruptions to supply

3.8 Short interruptions to supply will be defined as follows:

The number of customer short interruptions to supply per 100 connected customers

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

3.9 A short interruption to supply is an interruption to customers due to a disconnection in the circuit upstream of the customers involved followed by the restoration of supply to all or some of the customers involved within a period of three minutes. This brings the definition more into line with European standards. The arrangements for monitoring short interruptions are outlined in Chapter 2.

Appendix 4 Possible approach to disaggregation of output measures

4.1 Chapter 2 explained that Ofgem had done some further work on how circuits could be classified into distinct categories using different factors. This Appendix summarises this work although this will need to be developed, including obtaining data from all distribution businesses.

4.2 The table below shows one way of classifying circuits based on the percentage of overhead line on the circuit and the circuit length per customer. As explained in Chapter 2 it appears that these two factors have an impact on network performance.

Table A1: Disaggregation of output measures

	% Overhead line				Network length (km) per 1000 customers			
	0 to 10	11 to 60	61 to 80	81 to 100	0 to 10	11 to 30	31 to 50	more than 50
Score	1	2	3	4	1	2	3	4
Possible weighting	1	1	1	1	0.75	0.75	0.75	0.75
Adjusted score	1	2	3	4	0.75	1.5	2.25	3

Max score 7.0

Min score 1.75

4.3 Each HV circuit would be awarded a total score depending on its characteristics. It would then be possible to classify the circuits into distinct categories depending on the score that was awarded. For example:

- a score of 1.75 to 3 is an urban circuit;
- a score of more than 3 and up to 5.25 is a suburban circuit; and
- a score of more than 5.25 up to and including 7 is a rural circuit.

4.4 It would be necessary to consider the relative weightings of the factors - which should be driven by the impact that it has on network performance – and the bandings within each factor.

4.5 Once all the HV circuits on a network have been classified it should be possible to compare and normalise for differences across distribution businesses. For example, it may be appropriate to normalise according to the deviation of the average score for an individual network to that of the average score across all distribution networks.

4.6 As distribution businesses collect information on network performance at a circuit level before aggregating it to a company level it would also make be possible to make comparisons of performance on network related output measures at a disaggregated level.

4.7 Ofgem does not consider that the method identified above is necessarily the correct approach, or that there are not other differences between distribution businesses which could be normalised for. However, it represents a first step and is more sophisticated than the composite variable approach used during the last distribution price control review. An important part of the work going forward on incentive regimes will be to develop a robust normalisation method. Ofgem expects to work with the distribution businesses in this area. The timetable and process for the work on incentive regimes will be published in December 2000.

Appendix 5 Levels of connectivity

5.1 The table below summarises, in broad terms, the different levels of connectivity and where distribution businesses are in relation to each other. It should be noted that this is based on the initial review of measurement systems undertaken by PB Power, as set out in their report, which was published in July on Ofgem's website. Some distribution businesses are in the process of making improvements to their measurement systems.

Table A2: Levels of connectivity

Level of connectivity	Explanation	Distribution businesses
Averaging or estimating at all voltages the impact on customers of incidents on the network	There is no link between customer information and the physical network. Distribution businesses use averaging or estimating techniques at all voltage levels to calculate the number of customers affected by a particular incident. For example, customers can be associated to the network (and therefore incidents) by geography or postal code. The method of averaging and estimating can vary across distribution businesses.	Eastern, Southern, London
HV/LV transformer connectivity (averaging or estimating at LV level)	There is a link between customer information and the physical network at the HV/LV transformer, although the robustness of this link vaires across distribution businesses. This means that distribution businesses are able to capture with more accuracy the impact on customers of incidents on the HV network. There is still averaging and estimating at the LV level which varies across distribution businesses.	Manweb, Norweb, Seeboard, Swalec, South Western, ScottishPower
LV circuit connectivity (averaging for phases)	There is a link between customer information and the physical network at the outgoing circuit from the HV/LV transformer. This means that distribution businesses are able to capture with much more accuracy the impact on customers of incidents on the LV network. There is still averaging at the phase level and different sections of the LV circuit.	East Midlands, Northern, Hydro-Electric, Yorkshire
LV node connectivity	There is a link between customer information and the physical network at the LV node. This means that the distribution knows which section of the LV circuit a customer is connected to. There is still averaging at the phase level.	Midlands
Phase connectivity	Customers are typically connected to one of three phases from the LV node. With phase connectivity there is a link between customer information and the individual phase they are connected to. This is the most detailed level of connectivity.	

Appendix 6 Draft licence modification for IIP reporting framework

1. The purpose of this Condition is to secure the collection of information on a common basis by each PES Distribution Business and to an appropriate degree of accuracy:

   (a) to facilitate the establishment and operation of an incentive scheme ("the scheme") to improve the operation and outputs of the Distribution Business; and

   (b) to monitor any perverse incentives arising from the collection and publication of such information and from the operation of the scheme.

2. In order to achieve the purpose specified in paragraph 1, the Licensee shall establish appropriate systems, processes and procedures to measure and record the information specified in paragraph 3 from the dates specified in paragraph 4 and in accordance with paragraphs 5-8 of this Condition and any Regulatory Guidance from time to time issued by the Authority.

3. The information specified for the purpose of paragraph 2 ("Specified Information") is:

   (a) the number of interruptions in the supply of electricity through the Licensee's distribution system which occur in each period of 12 months commencing on 1 April in each calendar year having a duration of –

      (i) less than 3 minutes, together with the number of customers whose supply was interrupted by each interruption and the cause of that interruption; and

      (ii) 3 minutes or more, together with and in respect of each interruption –

         (aa) the number of customers whose supply of electricity was at any time and from time to time interrupted; and
         (bb) for each customer the duration of the interruption; and

   (b) such other information as may from time to time be specified by the Authority, after consulting the Licensee and the licensee of each other PES Distribution Business, by notice to the Licensee.

4. Specified Information shall be collected in respect of:

   (a) the matters specified in sub-paragraph (a) of paragraph 3 from and including 1 April 2001; and

   (b) any matter specified under sub-paragraph (b) of paragraph 3 from the date specified in the notice given under that sub-paragraph.

5. The Licensee shall install, maintain and operate, or procure the installation, maintenance and operation of such appropriate systems, processes and procedures

to secure the recording of Specified Information from the relevant date specified in paragraph 4 in such manner and to such standard of accuracy and reliability as may be from time to time set out in Regulatory Guidance.

6. The Licensee shall on or before 30 April 2002 and 30 April in each succeeding year (or such later date as the Authority may by notice specify) provide to the Authority the Specified Information in respect of the period of 12 months expiring on the preceding 31 March in such form and manner as shall be set out in Regulatory Guidance.

7. The Licensee shall permit a person or persons nominated by the Authority to examine the systems, processes and procedures referred to in paragraph 5 and their operation, the information to be provided under paragraph 6 and the extent to which each complies, and is in accordance, with Regulatory Guidance.

8. The Licensee shall (and shall procure, insofar as it is able to do so, that any affiliate of the Licensee, any person by whom it procures the performance of the obligation in paragraph 5 and any auditor of such person or of the Licensee shall) cooperate fully with the person or persons nominated under paragraph 7 so as to enable him or them to carry out, complete and report to the Authority on any examination carried out in accordance with that paragraph, including without limitation and insofar as necessary or expedient for such purpose; in each case subject to reasonable prior notice to the Licensee:

   (a) providing access to management, employees, agents or independent contractors of the Licensee to make any enquiries and to discuss any matters which are reasonably considered by such person or persons to be relevant to the carrying out of such examination;

   (b) giving to such person or persons access at reasonable hours to any premises occupied by the Licensee or any other person in performing the obligations set out in this Condition; and

   (c) allowing such person or persons at reasonable hours:

      (i) to inspect and make copies of, and take extracts from, any documents and records of the Licensee maintained in relation to Specified Information;
      (ii) to carry out inspections, measurements and tests on or in relation to any systems maintained and operated for or in relation to this Condition; and
      (iii) to take onto such premises or on to or into any assets used for the purpose of its Distribution Business such other persons and such equipment as may be necessary or expedient for the purpose of carrying out its examination.

9. In this Condition:

   "PES Distribution Business" means the Distribution Business of each public electricity supplier (as defined in the licence issued under section 6(1)(c) of the Electricity Act 1989 to that supplier).

"Regulatory Guidance" means any guidance issued by the Authority for the purpose of this Condition after consulting the Licensee of each PES Distribution Business; and

"Specified Information" has the meaning given in paragraph 3.

10. Regulatory Guidance may include:

(a) different systems, processes, procedures, manners and standards for different classes of information;

(b) a timetable for the development of the systems, processes and procedures required to achieve the appropriate standards of accuracy and reliability.

(c) the meaning of words and phrases used in paragraph 3 or any notice given under that paragraph; and

(d) requirements for the recording of information associated with Specified Information which is reasonably necessary for the person or persons appointed under paragraph 6 to determine the accuracy and reliability of Specified Information.