REVIEW OF ENERGY LICENSING REGIMES IN NSW: MINIMUM SERVICE STANDARDS

A Report for the
Independent Pricing and Regulatory Tribunal

Prepared by NERA

January 2002
Sydney

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1. INTRODUCTION

This report has been prepared by National Economic Research Associates (NERA) for the Independent Pricing and Regulatory Tribunal (IPART).

The Minister for Energy has asked IPART to review the electricity and gas licensing regimes in NSW. In particular, IPART has been asked to recommend any changes to the current administrative arrangements, or licence conditions, required to ensure improved compliance with existing government policy objectives.[1]

IPART has commissioned NERA to assist with its review of the NSW energy licensing regime. The consultancy services NERA has been asked to provide fall into three parts, namely:

i. to provide advice on the most effective model for the NSW electricity and gas licensing regimes, given the current institutional arrangements;

ii. to develop a compliance monitoring and reporting framework which IPART can implement to discharge its role as the NSW licence regulator; and

iii. to assess the need for minimum performance standards for licensed electricity and gas businesses, and to advise on the appropriate process for developing any such minimum performance standards.

This report covers the last of these three parts, ie, assessing the need for minimum standards for energy sector licensees. As such, it develops the rational for minimum performance standards and advises on practical implementation issues.

1.1. Purpose

The purpose of this report is threefold, namely to:

i. provide an analytical framework that defines both what is meant by minimum service standards and the role such standards may play within the overall regulatory framework;

ii. describe the issues that must be decided in adopting a given set of minimum standards and the associated practical implementation issues; and

iii. provide a summary of approaches taken in other regulatory jurisdictions.

[1] Terms of Reference from the Minister for Energy with respect to the Review of Electricity and Gas Licensing Regimes in NSW.

1.2. Scope of Report

This report addresses the implementation of minimum standards in the regulatory regime for the NSW electricity and gas sectors. In doing so it is necessary for us to make reference to potential inter relationships between the regulation of average and minimum standards. However, addressing the appropriate regulation of average standards is outside the scope of this report. The distinction between minimum and average standards is further elaborated in section 3 below.

While the report covers minimum standard regulation of both retail and distribution of energy our primary focus is on minimum standards as they apply to distribution activities. This reflects the contestable nature of retail activities and the ability of consumers to "shop around" on quality of supply in the retail sector.

It is useful to note at the outset that discussion of reliability minimum standards in other jurisdictions in section 3 is concentrated on the electricity sector as, to the best of our knowledge, only the United Kingdom has set minimum reliability standards for gas distribution. This reflects the technical characteristics of gas supply that make interruptions to supply much less frequent in gas than in electricity (namely, the underground nature of distribution assets and the system safety considerations).[2]

Nonetheless, the theoretical discussion of minimum reliability standards applies equally to gas and electricity distribution. Furthermore, although the Office of Regulator-General in Victoria (ORG) does not presently have minimum reliability standards in gas it is currently looking into their potential use.

1.3. Structure of this Report

The remainder of this report is structured as follows.

In section 2 we provide a definition of minimum standards used in this report and set out an analytical framework that distinguishes between regulation of minimum standards and other forms of service standard regulation.

In section 3 we describe the current regime of minimum standards in NSW and potential problems with this regime.

In section 4 we describe the practical issues that must be resolved in implementing a set of minimum standards and, in doing so, we provide examples of how other jurisdictions have resolved these issues.

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[2] For example, the experience of the Victorian gas networks in 2000 was that there was only between 2.5 - 11.9 unplanned hours off supply per 1000 customers, which were mainly caused by third party damage; "Gas Industry Comparative Performance Report 2000", ORG, September 2001, p2

In section 5 we highlight the process going forward.

2. RATIONALE FOR REGULATION OF MINIMUM STANDARDS

In this section we set out the need for regulation of quality standards under incentive regulation regimes. We define regulation of both minimum and average standards and distinguish between the objectives each can be used to serve. In doing so we note that the need for regulation of standards is stronger for the natural monopoly sectors (distribution of gas and electricity) than it is for the competitive sectors (retail of gas and electricity).

2.1. Why Regulate Quality of Service?

Competitive forces with well informed customers can provide strong incentives for businesses to provide an efficient mix of price and quality to customers. To some extent the same may be true in unregulated monopoly markets where a monopolist can extract a higher price if they provide higher quality. However, this may not be the case for natural monopolies where revenue is completely decoupled from the standard of service supplied.

Energy distribution businesses in NSW are natural monopolies. The prices for distribution services are regulated by IPART under an "incentive regulation" regime. Incentive regulation provides a financial incentive for businesses to reduce costs, with any cost savings being initially kept by the businesses and then, over time, passed onto customers in the form of lower prices. If there is no regulation of the quality of service supplied to customers, then such a regime can create inappropriate financial incentives for businesses to reduce costs at the expense of the quality of service provided.

Ideally, the regulatory regime will provide a framework that will encourage businesses to provide an efficient mix of both quality of service and price to the customer. Regulation that focuses purely on costs implicitly provides an incentive to reduce the quality of service through lower investment and maintenance expenditure, since this will reduce costs and thereby increase profits. This provides a strong rationale for measures of quality to be explicitly incorporated into the regulation of energy distribution businesses.

The argument for regulation of service quality is less clear for the retail sector, where competition for all customers will be introduced from January 2002. Retailers may choose to compete on service quality as well as price. Competition between retailers provides the opportunity for customers to "shop around" to find the mix of price and quality that best suits their needs.[3] In recognition of this fact we focus in this report on regulation of minimum standards in gas and electricity distribution.

[3] An argument can be made that providing information to retail customers on the quality of service provided by retailers in the past may improve the efficiency with which customers can shop around. This will be true to the extent that such data can be meaningfully measured and has elements itself of being a public good and would be an argument in support of retaining Key Performance Indicators in the retail sector.

2.2. How to Regulate Quality of Service – The Role of Minimum Standards

Conceptually, incentives to trade off lower cost with lower quality could be efficiently incorporated into the regulatory regime if businesses face a financial penalty/reward that reflects the marginal value each customer places on lower/higher quality. This would provide businesses with the incentive to improve quality only when the (marginal) cost of doing so is less than the (marginal) benefit. However, this ideal may be impractical to implement for a number of reasons – not least because not all elements of quality are easily measurable on a per customer basis and not all customers place the same marginal value on each dimension of quality.

In practice, the first step in including quality standards in regulation is to develop a clear definition of the different dimensions of "quality". The next step is to determine which elements of quality of service should be focused on. The criteria for determining these elements should be that they are:

- important to the customer;
- controllable by the regulated firms; and
- measurable by the regulator.

2.2.1. Minimum versus average standards

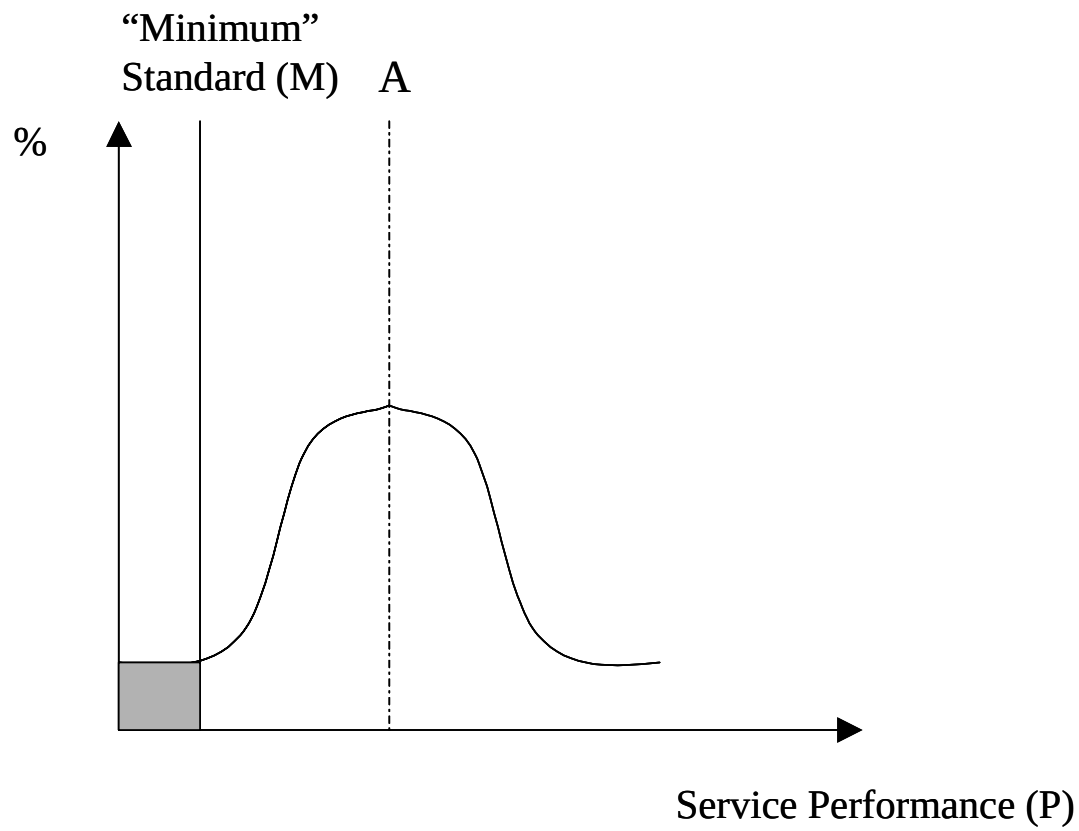
Quality of service standards can be divided into two main categories, namely, minimum and average standards. Minimum standards, are measures of the quality of service experienced by individual customers (or some larger sub set of the total customer base). Average standards (or overall standards) measure the level of quality as an average across all customers. Put simply, average standards are used to provide an incentive to maintain or improve the overall quality of service experienced by customers and minimum standards are used to ensure that average improvements in quality are not achieved at the unreasonable expense of particular sub sets of the customer base.

It is important at the outset to note that the concept of a 'minimum' standard is somewhat of a misnomer. It is impossible to establish a standard of performance which, under all circumstances and for all customers, will never be breached. In this report we define a minimum standard as being a standard that if breached for an individual customer (or sub set of customers) will result in some penalty to the regulated business (eg, a financial penalty or "public shaming").

Figure 3.1 shows the probability distribution of a certain level of performance, P. It is assumed that P follows the typical 'normal distribution', with an average performance level of A being achieved. However, underlying this average there will be outliers in performance – both performance which significantly exceeds the average level (shown by the right hand

'tail' of the graph), and performance which is significantly below the average level (shown by the left hand tail of the graph).

Figure 2.1: Distribution of Performance Outcomes



If a 'minimum standard' is set at M, it will therefore be the case that, although the business may achieve an average performance of A, well in excess of M, there will still be individual cases where the business is in breach of this standard. These cases are indicated by the shaded area in the graph. As a result, rather than thinking in terms of absolute 'minimum' standards, it is important to think in terms of a standard of performance, below which some form of penalty is triggered.

Regulation of average standards are beyond the scope of this report. Nonetheless, it is important to understand their character as well as their strengths and weaknesses in order to understand the role of regulation of minimum standards. Increasingly, regulators are introducing incentive schemes aimed at improving average performance. In Victoria, the Office of the Regulator General has linked this financial incentive with the price control mechanism for electricity DNSPs. In the UK, Ofgem has also put forward proposals in relation to incentives for service performance for the electricity DNSPs. In relation to the graph in figure 2.1, such incentive schemes are designed to shift the position of "A" to the right.

Examples of average standards in the electricity sector could include:

- connecting X percent of customers within two working days of issuing them with a contract;
- planned average minutes off supply per customer;
- unplanned average interruptions duration per customer; and
- average number of unplanned interruptions per customer.

However, average standards alone do not necessarily encourage businesses to maintain or improve quality of services to all customers. The business may concentrate on those standards and customers where it is easy to improve performance and not concentrate on those who receive the lowest level of service – potentially worsening both efficiency and equity of outcomes (as discussed in the following section). In terms of Figure 2.1, a business may respond to average performance incentives by stretching the distribution to the right and the left (increasing quality to most customers while reducing the quality to the worst served customers).

Minimum standards can be used to remove or control such incentives. Examples of minimum standards in the electricity sector include:

- requirements to provide notice for planned interruptions;
- maximum durations for non supply of electricity to individual customers; and
- maximum frequency of interruptions to individual customers;

As discussed later, many jurisdictions include such minimum standards in their regulatory regimes.

2.2.2. Objectives of minimum standards regulation

By targeting levels of service to individual customers or to other subsets of customers, minimum standards can be used to achieve both equity and efficiency objectives.

Arguably, minimum standards are most effective in ensuring equitable outcomes across the customer base. Inevitably there will be some geographic areas within a business's overall service area that receive worse quality of service than other areas due to the cost of improving quality in those areas (eg, electricity customers living in areas of high storm frequency). However, if quality of service received by those customers falls too far below the average then it is likely that this will be perceived as "unfair" or inequitable. What constitutes an "unfair" level of service is inevitably a matter of judgement and will depend on a number of factors including:

- the average level of service for all customers;

- the extent to which access to a given quality of service is considered to be an "essential service";
- the cost of improving quality in those areas; and
- the price that customers are currently paying for the current level of service (and whether it adequately reflects current costs of provision).

By setting minimum standards it is possible to improve equity in two distinct ways:

- firstly, businesses can be given an incentive to improve outcomes for the worst affected customers; and
- secondly, even if businesses do not perform above those minimum standards, affected customers may receive financial compensation.

However, minimum standards can also be used to promote economically efficient[4] outcomes as well as equitable ones. This will be the case where the cost to the customer of reductions in measured quality rises more than proportionally with the measure of quality. For example, if the inconvenience of a six hour interruption of energy supply is more than double the inconvenience of a three hour interruption of energy supply, then it will be efficient to give greater incentive to avoid a six hour interruption of supply than two three hour interruptions.

In this situation, there may be efficiency benefits from having regulation of minimum standards alongside regulation of average standards as this will increase the incentive on the business to avoid longer interruptions of supply. However, it should be noted that the extent of any such benefits will depend themselves on the structure of incentives under the regulation of average standards and how well these incentives reflect customers' true value of quality. For example, if measurement of average performance only includes interruptions above a given number of hours (say 4) then the efficiency benefits from minimum standards will be smaller than if average performance measurements included all interruptions no matter how short. This is because average standards will already have an inbuilt penalty against longer interruptions.

2.3. Other Mechanisms for Protecting the Worst Served Customers

In addition to (or as an alternative to) explicit minimum standards it is possible to introduce / rely on other regulatory powers to protect the worst served customers.

[4] Where economic efficiency is defined as improving if the beneficiaries of a change could compensate any losers and remain better off than they were without the change.

By way of example, the Victorian Electricity Distribution Code has “good asset management” provisions. Where a distributor is considered to be supplying unacceptably low levels of service to particular customers, the regulator may be able to take action against the distributor for breaching its license conditions in this regard.

Arguably, it would be preferable not to rely on such measures due to a potential lack of transparency as to the application of such powers.

3. QUALITY OF SERVICE DIMENSIONS AND THE NSW EXPERIENCE

This section provides a brief summary of dimensions of quality that are subject to minimum standards in various jurisdictions outside NSW. We then give a description of the current minimum standard regime in NSW and potential problems with these standards.

3.1. Dimensions of Quality Regulated by Minimum Standards

There are many different dimensions of quality of service that can potentially have minimum standards imposed. A full list of examples from jurisdictions surveyed in the European Union, the United States and Australia are provided in appendix A.

Different dimensions of quality can be broken down into three categories: reliability of supply; quality of supply; and quality of customer service. We provide examples of each of these three dimensions in the following three subsections.

Of the jurisdictions surveyed in this report, common dimensions of quality to which minimum standards apply include:

Table 3.1: Common examples of minimum standards

Minimum Standard	Financial Penalty Applied in Surveyed Jurisdictions
*Reliability of supply standards**	
Duration of non–supply	Yes
Duration of non–supply due to suppliers' fuse	Yes
Frequency on non momentary interruptions to supply	Yes
*Quality of supply standards**	
Voltage quality	No
Customer service standards	
Connecting supply	Yes
Notice of supply interruption	Yes
Appointment scheduling	Yes
Billing accuracy	Yes

*Reliability standards and quality of supply standards apply only in electricity

3.1.1. Examples of reliability minimum standards

Reliability of supply relates to the length and number of interruptions of supply a customer experiences. Reliability can be measured in at least three different ways:

- duration of a single interruption to supply;
- frequency of interruptions above a certain length per annum;
- total number of hours interruption per annum (which can be viewed as a proxy for total value of energy not supplied per annum).

In determining what dimensions of reliability customers' value most it may be useful to examine surveys of customer's stated willingness to pay for improvements in the quality of each dimension. Alternatively, it may be possible to simply apply a "common sense" approach to these issues. For example, it may be surmised that customers most value a return of energy supply within the time taken for a house to lose stored heat in winter. Alternatively, it could be based on the time taken over which two mealtimes may be interrupted (say, around 6 hours).

Another important area of difference between jurisdictions relates to what causes of interruptions are excluded from counting against the minimum standard. This issue relates to the degree of control a business has over the relevant dimension of quality and is dealt with separately in Section 4.6 below.

The following sections summarise the minimum standards adopted in other jurisdictions.

3.1.1.1. Duration

The different minimum standards imposed or proposed in other jurisdictions for duration and frequency of interruptions in electricity supply are summarised in the following two tables.

Table 3.2: Duration Minimum Standards

Jurisdiction	Minimum Standard	Financial Penalty
Victoria (electricity)	• 12 hrs	Yes
Queensland (electricity)	• 3 hrs (CBD) • 12 hrs (Urban) • 18 hrs (Rural)	No
Netherlands (elec.)	• 4 hours	Yes
Portugal* (electricity)	• 4 hr (urban) • 5 hrs (rural)	Yes
United Kingdom (elec.)	• 18 hrs	Yes

Italy* (electricity)	• To be determined (Low Voltage) • To be determined (High Voltage)	Yes
United Kingdom (Gas)	• 24 hrs	Yes

*Proposed standard for response to supplier's fuse failure

Italy, Portugal, Netherlands, UK, Queensland and Victoria all have minimum standards for the duration of a single interruption to electricity supply proposed or already in place[5]. However, they differ in terms of the number of hours allowed under the standard and how the standard varies across the customer base. For example, Queensland has set a minimum standard that CBD customers should not be without power for more than three hours while urban and rural customers should not be without power for more than 12 hours or 18 hours, respectively. On the other hand, the UK and Victoria have set "across the board" minimum standards of 18 and 12 hours respectively, for all customers. Of those jurisdictions surveyed that impose financial penalties, the Netherlands has the most stringent minimum standard for return of supply of 4 hours across the board. Portugal maintains the same standard across its customer base but varies the magnitude of its penalty scheme according to the voltage level customers are supplied at. This approach recognises the fact that interruptions of supply are more costly for large energy users than for low energy users.

The UK has recently establish duration minimum standards on independent gas networks which will apply from April 2002, these standards parallel those already established for Transco which owns and operates the national transmission network. The UK was the only jurisdiction surveyed that currently has penalties for duration minimum standards although the ORG has recently indicated that they would consider introducing minimum standards to the gas sector.

3.1.1.2. Frequency

Table 3.3 summaries the minimum standards for the frequency of interruptions established in other jurisdictions.

[5] Italy will impose a duration minimum standard but has yet to decide both the standard and the penalty.

Table 3.3: Frequency Minimum Standards – Electricity Supply

Jurisdiction	Minimum Standard
Victoria	All customers (outages over 1 min) • 9 urban customers • 15 rural customers
Spain*	LV customers (outages over 3 mins): • 12 (region with 20,000+ customers) • 15 (regions with 2,000 to 20,000 customers) • 18 (regions with 200 to 2,000 customers • 24 (regions with less than 200 customers) MV customers (outages over 3 mins): • 8 (region with 20,000+ customers) • 12 (regions with 2,000 to 20,000 customers) • 16 (regions with 200 to 2,000 customers • 20 (regions with less than 200 customers)
Portugal*	LV customers (outages over 3 mins): • 12 (localities with 25,000+ customer) • 26 (localities with 5000-25000 customers) • 46 (localities with less than 5000 customer) MV customers (outages over 3 mins): • 8 (localities with 25,000+ customer) • 20 (localities with 5000-25000 customers) • 40 (localities with less than 5000 customer) HV customers (outages over 3 mins): • 8 interruptions all localities EHV customers (outages over 3 mins): • 3 interruptions all localities
United Kingdom*	All Customers (outages over 3 hrs) • 3 interruptions

***Proposed

Minimum standards for the frequency of non momentary interruptions are proposed or are in place for electricity distributors in the UK, Portugal, Spain and Victoria. While they all only include interruptions above a minimum period, each jurisdiction has taken a different approach to how long that period should be. For example, in Victoria electricity distribution businesses are allowed 9 interruptions for urban customers and 15 interruptions for rural customers of supply of greater than one minute per annum before incurring a minimum standard penalty. However, businesses in the UK are only allowed three interruptions per annum of greater than 3 hours each across the entire customer base. Clearly, the UK proposal places greater weight on penalising long lasting interruptions and less weight on penalising shorter interruptions. In Portugal and Spain only interruptions above 3 minutes are counted towards this type of minimum standard.

3.1.1.3. Cumulative hours of interruptions

Only Portugal and Spain impose minimum standards for the cumulative hours of interrupted energy supplies. As with the frequency minimum standards in those jurisdictions, the level of these standards varies depending on the customer's voltage of connections. Full details are provided at appendix A.

3.1.2. Examples of quality of supply minimum standards

The quality of supply for electricity and gas can be broken down into the quality of electricity voltage and the quality of gas pressure and chemical composition respectively.

Gas pressure standards appear to be generally covered by overall safety standards and are not the subject of minimum standard regulation in the jurisdictions we have surveyed. The quality of chemical composition of gas supplied is a result of the production process and is generally beyond the control of the distributor or retailer. However, the distributor may be required to test for chemical composition as it enters the distribution system. In any event, chemical composition is inevitably an issue of average standard regulation rather than minimum standard regulation.

Voltage quality is a growing concern for electricity customers and is closely related to the fact that customers' equipment is becoming more sensitive to variations in voltage quality.

Of the jurisdictions surveyed, voltage standards tends to be applied uniformly at a national level. However, there is often no monitoring of performance against these standards and, even where monitoring exists, no jurisdictions sampled actually impose any penalties for breaches of minimum standards. This primarily reflects the difficulty in measuring voltage quality. Voltage quality received by an individual customer can vary significantly compared to that received by other customers in nearby locations. As a result, voltage quality can only be accurately measured at the individual customer's connection point which would involve considerable expense in terms of investment in data collection technology.

As a reflection of this, several jurisdictions have minimum standards concerning the process by which businesses must respond to complaints about voltage quality. For example, Victorian businesses must provide a public statement of their compensation policies for equipment that is damaged through poor quality of voltage supplied and this must be consistent with guidelines given force through an amendment to the Distribution Code. Businesses have been compensated for likely costs under these compensation schemes at cost of $20m or around $3 per urban customer. Portugal, Spain and the United Kingdom all have minimum standards for the time in which businesses must respond to a complaint about voltage standards (either in writing or by a visit to the customer's premises).

Nonetheless, it is potentially cost effective to gather more average data on voltage quality that can be used to infer the level of voltage quality received by individual customers. The Victorian regulator requires distributors to monitor voltage quality by installing equipment

at substations and at the opposite extremity of a feeder from that substation. It also requires businesses to survey voltage dips. The initial plan is to monitor and report on voltage quality data collected in this manner with a view to incorporating these dimensions into future regulation of average standards.

In the future, it may be possible to base some form of minimum standards on such information. However, it may not be appropriate to base individual customer compensation on this data as it will not always be an accurate reflection of the costs incurred by individual customers. Nonetheless, it may still be appropriate to impose financial penalties on the business when measured quality on the worst performing feeders falls below a given level. This would be similar to the current system used in South Australia where minimum reliability standards are imposed on the worst performing feeders and any penalties imposed are simply reflected in lower prices to all customers.

The need for minimum standards on voltage will also depend on the ability of customers to improve the quality of voltage by installing equipment on their own premises. For example, a customer with highly sensitive equipment may be able to improve voltage quality (or mitigate the impacts of poor quality) by installing, say, anti surge equipment on their premises. If this is the case, it may be most cost effective for customers to undertake this investment if they have voltage quality concerns.

3.1.3. Examples of customer service minimum standards

Most jurisdictions have some form of customer interface service standards that cover a range of services for both electricity and gas businesses. These include: responsiveness to (re)connection requests; billing accuracy; telephone response times; punctuality for appointments; and responding to customer claims. These minimum standards are common to both the electricity and gas sectors and in many cases involve mandatory or voluntary payments by companies when the standard is not meet. A full list of these standards is available at appendix A.

Table 3.4: Customer Service Minimum Standards – Energy Sector

Minimum Standard	Financial Penalty Applied in Surveyed Jurisdiction
Connection / Reconnection	Yes
Notice of planned interruption	Yes
Appointment scheduling	Yes
Responses to customer claims	Yes
Quotes for work	Yes

In Victoria a particular issue examined by the ORG was that of electricity fault call response times, especially in regional and rural areas. Rather than introduce minimum standards at this stage, the ORG stated that it will develop a framework for benchmarking this quality dimension with a view to introducing minimum standards in the future.

3.2. Minimum Standards in NSW

Currently, in NSW electricity sector licensees are required to meet certain minimum standards for customer service, known as Guaranteed Service Levels (GSLs).[6] There are currently no minimum standards set for reliability or quality of supply. The gas licensing regime does not contain any equivalent minimum standard requirements, for customer service, reliability or quality of supply.[7]

Table 3.5 sets out the current minimum standards applying in the NSW electricity sector.

Table 3.5
Guaranteed Service Levels applying to Electricity Retail Licensees and DNSP Licensees

Service Standard	Payment
Licensee more than 15 minutes late for an appointment	$25
Late connection	$60 a day, up to $300
Interruption to supply without 2 days prior notice, or for longer than the duration indicated in the notice	$20
Failure to repair street lights by date agreed	$15

Source: Electricity Supply (General) Regulation 2001, Schedules 2 and 3.

3.2.1. Potential issues with the NSW minimum standards

Current minimum standards in NSW are in some cases neither meaningful nor relevant to key customer concerns. For example, if a retailer is more than 15 minutes late for an appointment with a customer, the retailer must pay the customer compensation of $25.[8] However there is no corresponding obligation on retailers to set a specific appointment time. Therefore it has failed to develop a clear definition of the dimension of "quality" which in this case is improving retailers' appointment scheduling. As a result, retailers are able to avoid having to pay compensation under GSLs by setting broad appointment times. Indeed, customers may suffer *greater* disruption as a result of the GSL, to the extent that licensees only make appointments within wide time bounds. Data submitted to IPART shows that the

[6] The GSLs are set out in the Electricity Supply (General) Regulation 2001, schedule two, part two, and schedule three, part two.

[7] It should be noted that safety obligations themselves imply a 'floor' on performance standards, for both electricity and gas businesses. The Minimum Standards discussed in this section relate to performance which exceeds this safety floor.

[8] Electricity Supply (General) Regulation 2001, schedule two, part two, p89

total compensation paid to customers by electricity licensees as a result of a failure to meet this GSL in 2000/01 was $75. PIAC commented in its submission to IPART's Issues Paper[9] that community and consumer representatives did not support retaining this standard, as it has little practical meaning for customers and is unable to be enforced.

In the UK, the equivalent GSL is expressed in relation to '*making* and keeping appointments' (emphasis added), and requires the licensee to make a morning or an afternoon appointment, or a timed appointment if requested by the customer.

At the same time, the rationale for introducing GSLs relating to customer service standards for retailers is open to question in an environment in which full retail competition is being introduced in NSW for both the electricity and gas sectors from 1 January 2002. Quality of service, as well as price, is one variable on which retailers may choose to compete. Where a customer is unhappy with a lack of timeliness in a retailer making appointments, it may choose to move to an alternative retailer. Again, in the UK Ofgem has announced that the GSLs it currently imposes on retailers will be withdrawn at the same time as the price control on retailers is withdrawn (planned for March 2002). [10]

In addition, customer groups have focused on the desirability of introducing some form of minimum performance standard in relation to network reliability for electricity customers. The next section expands on the issues that will need to be addressed to ensure that any new minimum performance standards or the revisions of current GSL's are effective instruments to protect/improve the quality of service to worst served customers.

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[9] See PIAC submission to the Issues Paper, pps 8-9.

[10] These GSLs relate to responding within 5 days to customer queries about charges and payments, and making and keeping appointments.

4. PRACTICAL IMPLEMENTATION ISSUES

This section examines the practical implementation issues that must be resolved when deciding how to incorporate minimum standards into the regulatory regime. We also provide relevant examples of how these issues have been resolved in other jurisdictions. We address each of the following issues in turn:

- at what level should minimum standards be set?
- should minimum standards involve financial penalties?
- who should receive minimum standard penalty payments?
- if financial penalties are imposed, what is their appropriate magnitude and structure?
- who should initiate any financial payments?
- what exclusions should be made from the calculation of performance against minimum standards?
- what dispute resolution and auditing regime should apply?
- what interdependencies exist with other regulatory decisions?

It is useful to note at the outset that there does not appear to be any significant regulation of minimum standards in relation to the reliability of gas distribution services. This may reflect the higher degree of network reliability in the gas distribution industry. For example, the experience with the Victorian gas networks in 2000 is between 2.5 - 11.9 unplanned hours off supply per 1000 customers which were mainly caused by third party damage.[11] [12]

4.1. At What Level Should Minimum Standards Be Set?

For any given dimension of quality, each jurisdiction surveyed enforced the relevant minimum standard at different levels of quality of service. The issues that can influence the appropriate level of minimum standards are discussed below.

4.1.1. Efficiency versus equity

If promoting efficiency is the primary objective of minimum standard regulation then minimum standards will tend to be set at the level that marginal cost to the customer equals

[11] ORG, September 2001, "Gas Industry Comparative Performance Report 2000" p2

[12] Nonetheless, we note that, while the ORG does not presently have guaranteed service levels for reliability, it is currently looking into their use.

marginal cost to the business of improving quality[13]. In order to know what this level is would require both business cost and customer benefit information. However, it should be noted that not all customers will value quality the same way and there will not be the same marginal cost of improving quality to each customer. Therefore it will not be possible to have a single minimum standard across all customers that is efficient.

If promoting equity is of primary importance then it will be necessary for a judgement to be made about the level of quality which it is "unfair" for individual customers to experience without compensation.

While there are many ways of arriving at such a judgement, it is possible that the current level of quality may influence this decision. This is most likely to be the case if the introduction of minimum standards is seen primarily as protecting the current level of standards. For example, it may be decided that minimum standards should be set such that, under the current level of performance, only X percent of customers are eligible for a payment, (in the U.K. they have set X at 0.11% for frequency of interruptions standards[14]).

Both Spain and Portugal have proposed minimum standards for frequency of interruptions that capture both efficiency and equity objectives. By decreasing the number of allowable disruptions for higher voltage users, the standard reflects the higher marginal costs faced by large customers. Differentiation between regions reflects the extra costs to improve quality as customer density falls. Arguably, differentiation between regions may also reflect equity considerations to the extent that low density customers pay a lower proportion of fully distributed costs than do high density customers.

Three issues that may impact on the fairness of a minimum standards regime are:

- should different standards be set in different geographical areas;
- should the standards be additive;
- should the time period over which frequency minimum standards apply be set on a calendar year or on a rolling average year?

4.1.1.1. Rural /urban standards

The setting of a single standard for the whole of NSW may have both negative efficiency and equity consequences. Costs to improve quality may be substantially higher in rural regions due to the longer transmission lines, lower customer density and higher proportions of the network being above ground. If this is the case a single minimum standard for the whole

[13] And penalties for breaches will reflect the total benefit to the customer of that level of service relative to what would otherwise have occurred.

[14] Ofgem, November 2001, "Development of Multiple Interruption Standards for Electricity Distribution, Initial Proposals", p40.

state will tend to be too high for rural regions and too low for urban areas. If the minimum standard is set at a threshold that is appropriate for urban areas it is likely that businesses would opt to incur the cost of compensation payments rather than the (higher) cost of improving standards.

If, on the other hand, a lower uniform minimum standard is applied that reflects the higher cost of quality in rural areas businesses will have little incentive to improve on this standard in urban areas even if the cost of doing so is small. Differing minimum standards based on geography and population density are used (or have been proposed) in Victoria, Portugal and Spain.

4.1.1.2. Additive standards

If minimum standards for each performance dimension operate in isolation of each other then it is possible that:

- one customer could receive just above the minimum standard in all dimensions and receive no compensation; while

- another customer receives just below the minimum standard in one dimension and well above the minimum standard in all other dimensions receives compensation.

Arguably the customer receiving compensation is better served than the customer not receiving compensation which may, in turn, be considered unfair.

An alternative could be, for example, to base minimum reliability standards on an index composed of both the duration of a single interruption and the frequency of interruptions. This may possibly improve equity, however, such a scheme would add complexity to minimum guaranteed standard. As such, it is likely that an index approach to minimum standards would only be viable in a situation where automatic payments were feasible.

None of the jurisdictions surveyed employed the use of additive minimum standards.

4.1.1.3. Time period for frequency standards

The UK electricity regulator has argued that a rolling year time period for the calculation of frequency of interruptions would be fairer than one based on the number of interruptions in any given 12 month period. This is because a customer may experience above the allowable number of interruptions in a period of several months but be ineligible for compensation if that period fell into two different 12 month periods.

Some UK businesses have responded that this may impose higher administrative costs. Without accepting this assertion, Ofgem has agreed to base the standard on a single 12 month period (at least initially).

4.1.2. Administrative costs

The level of minimum standards may also be influenced by considerations of administrative costs. For example, a small number of larger penalties (ie, with standards set lower) may be preferable to a large number of small penalties (with standards set higher). This may also maximise equity and fairness benefits to the extent that the efficiency and equity problems of poor quality increase more than proportionally with reductions in quality. That is, high levels of standards and small payments may be undesirable if businesses then ignore the worst cases because the penalties are so small. In other words, there is a danger that if minimum standards are set too high they will tend to work in the same way as average standards (with no incentive to focus on the least well served).

Administrative costs may also be reduced to the extent that they can be coordinated with the standards set in the regulation of average standards. For example, if the regulation of average standards require businesses to keep data on the frequency of interruptions beyond one hour duration, it would likely minimise administrative costs if minimum frequency standards are also set on the basis of durations beyond one hour. To the extent this is the case it means that it may be appropriate for minimum standards and average standards to be considered in combination.

4.1.3. Changing standards over time

It is arguable that progressive tightening of standards can be inefficient as businesses may make investment decisions that are appropriate for one standard and inappropriate for another. For example, Ofgem[15] noted that tightening of frequency interruption standards in electricity may add additional unnecessary costs to business compared to simply introducing the higher standards immediately. This will be the case if tightening standards results in installing new auto-reclosing circuit breakers as well as reposition existing auto-reclosing circuit breakers. As a result, it may be inappropriate to introduce low minimum standards with a view to tightening them over time.

4.2. Should Minimum Standards Involve Financial Penalties?

Once minimum standards have been established it is important that these standards provide regulated firms with clear incentives to maintain appropriate levels of service quality. There are two distinct methods to provide these signals.

- moral suasion (“name and shame”)
- financial penalties.

[15] Ofgem, Development of Multiple Interruption and Other Standards for Electricity Distribution, Initial thoughts, August 2001.

Moral suasion involves the reporting by firms of their performance against the defined standards. This reporting can be both to the regulator and the public at large. Businesses may have an incentive to improve standards against the minimum standard benchmarks simply to improve their image amongst customer groups. A potentially more powerful incentive to maintain quality of service could be the threat of future financial penalties being introduced if performance against these benchmarks is poor. Minimum standards without explicit financial penalties can also be referred to as target "key performance indicators".

Financial penalties are more transparent than moral suasion and may therefore be favoured where there is reasonable certainty and agreement concerning:

- a clear measurable definition of the relevant dimension of quality (without such a measure it will not be possible to align financial penalties with the actual relevant dimension of quality);
- information on the cost to customers of poor quality (without this it may not be possible to set the right level of financial penalties in order to provide the appropriate level of incentives/compensation);
- an accurate estimate of a net "reasonable" cost that financial penalties will impose on businesses. (This is needed to allow prices or regulated revenues to increase to provide compensation to the firm for costs of a "reasonable" level of claims under the measure.)

If these issues cannot be immediately resolved it may be appropriate to simply collect and publish data until they can be (eg, collect data on quality of supply until it is clear that there is a problem that warrants financial penalties and an appropriate level of such penalties can be determined).

4.3. Who Should Receive Minimum Standard Penalty Payments?

If penalty payments are to be implemented an important issue is to determine who should receive these payments. Internationally there are essentially three different options:

i. Only individual customers who receive service below minimum standards (this is the most common approach);

ii. Groups of customers who are, on average, badly served (this approach is employed in Italy and, to some extent, in Victoria[16]); and

[16] Italy is divided into regions and customers in those regions where electricity distributors fail to meet the minimum standard pay a lower price for their electricity distribution service. In Victoria it is only possible to identify customers from a feeder, rather than a particular phase, so distributors are required to compensate all customers on a feeder if there is an outage from one of the three phases associated with that feeder.

iii. All customers through a general reduction in prices (this approach is employed in South Australia[17]).

We discuss each of these options in more detail below.

4.3.1. Individually targeted payments

Individual payments to affected customers have the advantage of both providing direct financial incentives for regulated businesses to improve quality and also of ensuring that compensation is most effectively targeted at those customers who receive the poorest service. However, requiring individual payments can create implementation problems if it is not easy to identify those customers who received quality below the minimum standard. This may in turn mean that customers must initiate claims for payments rather than receiving them automatically. The issue of customer initiated versus automatic payments is discussed in more detail in section 4.5 below.

4.3.2. Targeting payments to sub groups of customers

If information on the average level of service amongst a sub group of customers is more readily available than information on the actual level of service received by individual customers, it may be appropriate to provide all customers in that sub group with a rebate for service below the minimum standard. In this situation, the minimum standard is effectively set at an average for all customers in that sub group.

Such a system could provide as good incentives for regulated businesses to improve service quality to the worst served areas as would a system of individual payments. However, it would not ensure that compensation was targeted to those individuals who are worst served (as everyone in the particular area would receive the rebate irrespective of whether they individually received the low quality of service). Thus efficiency and some equity objectives could be addressed through such an approach (to the extent that it improves service quality) but some equity objectives may not be met (to the extent that the worst affected individuals must share compensation with other individuals who were not as badly affected).

Italy has a system where the average price paid for electricity distribution services in a particular zone depends on the measured quality in that zone. Clearly, the smaller the zone the smaller the loss of any equity objectives from such an approach. Victoria has a similar system in regards to the minimum standard for the frequency of non-momentary interruptions to electricity supply. In Victoria, if a single phase[18] suffers a outage then the

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[17] Targets the bottom forty feeders and sets special standards for this group which is then factored into the overall "S factor" that determines allowable electricity prices.

[18] Generally, each feeder from a zone substation will have three phases (or three sets of lines). Each phase tends to serve approximately one third of all customers connected to that feeder.

business must[19] assume that all customers connected to that feeder have suffered an outage (even though in reality only about one third of customers will have actually suffered an outage). This approach has been adopted because Victorian businesses generally know which feeder a customer is connected to but not which phase. As a result, the minimum standard for frequency of interruptions is in reality an average standard for customers connected to a feeder.[20]

Victoria takes a similar approach to zone substation outages. In that situation Victorian electricity distributors know that approximately 90 percent of all customers affected will be in a particular area and that about 10 percent of all customers in that area will not be affected. Nonetheless, where the outage results in a breach of minimum standards, Victorian businesses must pay compensation to all customers in that area. This means that if 100 customers are affected by an outage then only 90 of them will receive automatic compensation. Further, it means that a further 10 customers who were not affected by the outage will also receive compensation. Affected customers who do not receive automatic payments have the right to initiate claims for payment.

4.3.3. Spreading payments across all customers

In order to target payments to individual customers or customer groups it is necessary to be able to match events to affected customers' bills. This creates a problem as even if a business knows that all customers in area X suffered a six hour interruption to supply, it may not be able to match the customers in area X to the correct set of customers in its billing system. To the extent that this is the case, then direct compensation of the worst affected customers may be impractical.

However, it is still possible to provide a financial incentive for businesses to improve the quality of service to the worst affected customers by:

- identifying areas that suffer poor quality; and
- penalising/rewarding the business for reductions/improvements in quality of supply in that area.

This is the approach that has been adopted in South Australia where the forty worst feeders are identified and performance on these feeders is measured and incorporated into the overall quality incentive mechanism. This means that the South Australian electricity distribution business has an incentive to improve both average and minimum standards.

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[19] Unless the business performs a field inspection to determine which houses are connected to which phase.

[20] For example, if the same phase suffers an outage nine times in an urban area all customers connected to the feeder will be eligible for compensation. In effect, this means that there is an average minimum standard for customers connected to that feeder of 3 phases' related outages per annum. In the above scenario, this average standard could be exceeded and all customers receive compensation even if two thirds of customers never experience an outage.

However, any failure to improve standards on the forty worst feeders results in a reduction in prices for all customers and, on the flip side, any improvement in quality of service results in an increase in prices for all customers (not just for those on the forty worst feeders).

4.4. If Financial Penalties are Imposed, What is Their Appropriate Magnitude and Structure?

The same issues described in relation to determining the level of standards also relate to the level of financial penalties. In general, the more stringent the minimum standard the more appropriate it is to have higher financial penalties for breaches both on efficiency and equity grounds. A number of additional design issues can also be considered when determining the level of financial penalties. The remainder of this section addresses these.

4.4.1. Compensation for businesses for expected penalties

If businesses are not compensated for the likely cost of minimum standards then they will receive a lower return on capital than would otherwise have occurred. To the extent that the current regulatory regime delivers an appropriate level of return on capital then failure to compensate businesses for the additional cost of minimum standards would lead to an inappropriately low return on capital.

In order to determine the compensation required the identification of:

- the reasonable expected number of breaches of that standard;
- the expected number of customer initiated payments (if payments are not automatic); and
- the reasonable increase in investment and maintenance costs that will be associated with any increase in performance against minimum standards that has been factored into estimation of the cost of paying customers compensation;
- the additional cost of administration of the scheme (eg, upgrades to information systems, running information campaigns concerning customer rights).

To estimate these variables it may be necessary to do some statistical survey and analysis on the NSW distribution businesses. In the United Kingdom, Ofgem has recently surveyed the effects of introducing a multiple interruption standard where they:

- examined estimates of number of interruptions that would be recorded under the standard;
- analysed the reliability of the estimates given;

- applied negative binomial and lognormal distributions to these estimates to determine if company variations were due to random variations or if real differences needed to be taken into account; and
- analyse the compensation needed if a minimum standard is introduced.

Many of these costs will be difficult to estimate prior to the first few years of data collection. This will be particularly true to the extent that it is unclear how any exclusion policy will affect the number of qualifying breaches (discussed in 4.6 below). With these issues in mind, there is an argument that data should be collected for some time prior to the introduction of financial penalties in order to improve the accuracy of cost estimates. Alternatively, it may be appropriate to introduce low penalties initially to limit the financial risk from inaccurate estimates of claims.

Another issue is the asymmetric nature of the impact of events on the number of breaches of standards. There are various catastrophic events (eg, storms, flood and earthquakes) that can cause significant breaches of the standards. If these types of events are not excluded from the regime then they will tend to cause the expected (mean) cost in any given year to be potentially substantially higher than the most probable (median) cost in that year. In effect, this would mean that in most years businesses would receive higher compensation than actual cost in that year but in some years they would receive significantly lower compensation than actual cost.

A further alternative would be to cap the total cost to businesses from penalty payments. However, this would itself reduce the incentives to mitigate against extreme events.

4.4.2. Form of price control

The form of price control can have an impact on the appropriate level of financial penalties. For example, under a revenue cap a business suffers no penalty as a result of an interruption to supply other than those penalties associated with the minimum standards. This is because the revenue cap allows businesses to recover any lost revenue due to the interruption through higher prices in the future. However, under an average revenue cap or a weighted average price cap businesses will suffer a financial penalty in the form of lower sales.

This issue suggests that there may be some benefits from determining the level of financial penalties concurrently with the form of price control.

4.4.3. Sliding scales for penalties

Spain and Portugal both impose higher levels of penalties the greater the breach in some minimum standards (eg, frequency of interruptions and cumulative number of interruptions). Arguably such a system can improve both equity and efficiency outcomes. However, it is not clear what additional administrative costs such a regime imposes.

4.4.4. Paying and capping compensation

It is possible that the least cost method for paying compensation will be through a reduction in a customer's bill. To this extent it will be necessary for distributors and retailers to develop systems that allow this to occur. This also raises the issue of whether customers should only be eligible for compensation up to the value of their total annual bill. Ofgem considered and rejected this proposal in relation to frequency of interruption standards for electricity distribution.

4.5. Who Should Initiate Payments?

This section discusses the relative merits of automatic versus customer-initiated payments for breaches of minimum standards.

Internationally there are different approaches to the payment of penalties. Payments in Italy, Spain, Victoria and some standards in the UK are automatic. In Portugal and for other standards in the UK the payment is by customer claim.

There is a strong argument to make payment automatic as customer claims increase the cost to customers of a breach of minimum standards and not all customers may claim. It also reduces the analysis needed to estimate the cost to businesses of the payments as there is no need to determine the percentage of eligible customers who will make a claim. In addition, minimum standards under a customer claim regime will need to be very simple as more complex standards increase the chance that customers will not know their rights and consequently not claim.

Nonetheless, current systems may not be able to identify individual customers or customer groups who have received poor quality. If this is the case, consideration should be given to introducing a system with customer initiated payments and a simultaneous campaign to inform customers of their rights. This would be a continuation of the current guaranteed service level regime in NSW (albeit with different standards established).

Consideration should also be given to developing the systems such that these payments can be made automatically. This will inevitably involve a cost that must be weighed against the potential benefits of such systems capability. In weighing these issues, consideration should be given to other benefits that may be derived from having such a database (eg, in terms of asset management and cost linked pricing strategies).

In this regard, it is useful to note that the UK electricity regulator allowed businesses a one off increase in revenue of 50p (around $1.50 at nominal exchange rates) per customer to

develop a data base that shows which customers are attached to a particular low voltage circuit from a distribution substation[21].

It is interesting to note that this appears to be the same information on which the Victorian regulator has required businesses to make automatic payments. As described in 3.3.2, the Victorian regulator has required businesses to assume that all customers on a given circuit (or feeder) are connected to any individual phase that has an outage. The UK regulator took a different approach and argued that it was not appropriate to base automatic financial penalties on "inaccurate" estimates of customers affected. As a result, the UK regulator opted for customer initiated payments.

4.6. Should Exclusions Be Made From the Calculation of Minimum Standards?

To the extent that it is possible to accurately exclude events that cannot be mitigated against by the business then such exclusions are useful in reducing the need for businesses to manage risks beyond their control. Exclusions tend to apply to continuity of service standards rather than any customer interface or voltage standards.

[21] Ofgem, August 2001, "Development of Multiple Interruption Standards for Electricity Distribution, Initial Thoughts", para 2.13. This database was developed in order to aid the implementation of average standards. However, the information did not show to which phase on that circuit individual customers are attached.

Examples of exclusions for continuity of service are:

Table 4.1: Exclusions from minimum standards - Electricity

Jurisdiction	Description
Victoria	• exclusions for certain limited events "beyond the control" of the utility; • utility must be able to show that it was unable to mitigate against the impact of the event;
United Kingdom	Open to determination of regulator and companies can claim exceptional circumstances (not defined)
Portugal	• fortuitous reasons or force majeure, • service reasons, • public interest, • safety reasons, • facts attributable to client, • agreements with client. Force majeure occurs in these circumstances • general strike; • public order altercation; • fire; • earthquake; • flooding; • wind of exceptional intensity; • direct lightning strike; • sabotage; • malefaction; • duly proven third party intervention.
Spain	Force majeure: • acts of public authority; • natural disasters • severe weather conditions only if design requirements are exceeded. External causes: • damage by third parties; • interruptions caused by user; • loss of supply from national transmission grid; • loss of supply from distributors.

The ORG initially put forward the option of having no exclusions from its quality incentives regime. There are several arguments for doing this, including:

- it may make estimation of the number of breaches simpler (as there is no need to go back over historical data and attempt to determine where exclusions would have applied);

- it avoids the administration costs that will inevitably be associated with determining what events qualify for exclusion; and
- it maximises the incentive to improve standards as the impact on quality of service from any given event (including large catastrophic acts of god) can almost always be mitigated against by the business.

Against these potential benefits is the fact that a regime with no exclusions would mean that businesses would face asymmetric risks under minimum standards (the probability of significant outperformance against benchmarks would be significantly less than the probability of significant underperformance (in the event of an act of god). As discussed in section 3.5.1, this would mean that the compensation to businesses in any given year would have to be higher or the level of penalties for any given level of minimum standard lower.

However, an approach that had no exclusions and, as a result, lower penalties for breaches would have the effect of:

- increasing incentives to mitigate against extreme events where many small payments may have to be made; at the expense of
- reducing incentives to mitigate against "ordinary" events.

This may itself be undesirable from an equity / efficiency perspective. In its final decision, the Victorian regulator included a range of events that it would consider for exclusion provided the business could show evidence that it was unable to mitigate against the impact of this event. These events included:

- customer requested supply interruptions;
- load shedding due to a shortfall in generation;
- failure in the shared transmission network;
- failure in a transmission connection asset (to the extent that this was not due to inadequate planning of transmission connections);
- widespread supply interruptions due to rare events which were not reasonably able to be foreseen.

Planned interruptions to supply are also excluded by the Victorian regime from the calculation of frequency of interruption minimum standards. This can be partially justified on the grounds that planned interruptions where adequate notice is given are less costly to customers than unplanned interruptions. In addition, it can be argued that the regime should not create an incentive to delay necessary network maintenance in order to avoid financial penalties. An alternative argument is that customers who suffer a large number of

planned interruptions due to poor asset management strategies should not be disadvantaged by the exclusion of planned interruptions.

In terms of minimising costs, coordinating the definition of any exclusions between minimum standards and average standards will tend to reduce costs of administration. This is because businesses and the regulator will not have to apply two different sets of exclusion criteria to the same event.

4.7. What Dispute Resolution and Auditing Regime Should Apply?

Dispute resolution and auditing mechanisms are essential in any regulatory system. A well designed process will lower administrative costs while maintaining the integrity of the system.

Clear resolution processes will reduce the costs associated with conflicts between companies and customers. Internationally different systems have been established with the regulator playing a role in mediation, conciliation and arbitration.

Examples of resolution processes used.

Table 4.2: Resolution of Conflicts

Jurisdiction	Regulatory Body		Other bodies
	Mediation/Conciliation	Arbitration	
Italy	Yes	Yes	• Arbitration & Mediation Centres • Courts
Netherlands	No	No	• National Dispute Settlement Committee • Competition Authority
Norway	Yes	Yes	Arbitration Centre
Portugal	Yes	No	• Customer Associations • Arbitration Centres • General Directorate of Energy • Courts
Spain	No	No	Autonomous Governments
United Kingdom	Yes	Yes	Gas and Electricity Customers' Committees
Victoria	No	No	Energy and Water Ombudsman
Tasmania	No	No	Electricity Ombudsman

A system of auditing maintains the integrity of the system especially when the penalty system involves automatic payments. In the UK there is a system of independent auditors while in Victoria the system relies on the company's own quality assurance

procedures. There may be some economies of scale from aligning auditing regimes for minimum standards with those for average standards.

4.8. Interdependencies

The previous sections outline a range of issues that must be considered when introducing minimum standards. The analysis of minimum standards was interdependent with a number of other regulatory decisions. This section provides a brief summary of these interdependencies.

It is likely that the optimal minimum standard regime will be influenced by the following:

- Incentives under average standard incentive schemes - the structure of average standards can itself affect incentives to improve minimum standards.
  - for example, it is arguable that the stronger the focus in the average standard regime on interruptions of greater than a given length of time[22] the less the need for minimum standards. This reflects that as the stronger the focus on long duration outages in the average standard the closer the average standard comes to being an average for the worst served customers.

- Administration costs – reductions in administration costs are likely to the extent that the following elements of average and minimum standard regimes are synchronised:
  - definition of standards (eg, minutes off supply above a certain threshold with the threshold being the same for calculation of both average and minimum frequency of interruption standards);
  - exclusion policy; and
  - auditing policy.

- Form of price control – the form of price control can also impact on the underlying incentive to improve service quality and therefore on the appropriate levels of minimum standards and penalties.

[22] For example, average frequency standards may focus on average frequency of interruptions beyond 1 minute/4 hours duration per customer. Similarly, average duration standards may focus on the average minutes of lost supply per customer in excess of 0 hours/4 hours duration.

5. THE WAY FORWARD

The previous section identified issues for resolution in the introduction of minimum standards in NSW and provided examples of how many of these issues have been resolved in other jurisdictions.

We would recommend that IPART work closely with the Ministry of Energy in considering the issues raised in this report, with the aim of establishing a process going forward. This process should be one which involves the regulated businesses, as well as canvassing input from other interested parties. It should also be made clear how the process for establishing minimum standards is expected to interact with IPART's workstream in relation to the next regulatory reviews for both the electricity distributors and gas reticulators.

It is likely to be necessary to engage technical consultants to carry out statistical analysis in order to determine the likely cost to businesses of any given standards (in terms of compensation and investment costs). IPART should also seek input from businesses (either directly to it or to technical consultants) on:

- 'base case' minimum standards and the expected number of breaches assuming current levels of investment; and
- 'improvement targets' reflecting more ambitious minimum standards and the associated increase in penalty payments and/or expenditure required to reduce penalty payments.

Finally, the process should also identify what data is not currently available, and which it would be desirable for businesses to begin collecting, in order to allow the standards to be put in place.

REVIEW OF ENERGY LICENSING REGIMES IN NSW: MINIMUM SERVICE STANDARDS

APPENDIX A

A Report for the
Independent Pricing and Regulatory Tribunal

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APPENDIX A. INTERNATIONAL COMPARISON

Appendix A covers an international survey across Europe, Australia and the United States of regulatory jurisdictions that impose minimum performance standards on the energy sector. The sources for this survey included published studies, regulatory and company websites as well as government discussion papers.

Tables have been broken down into geographical regions of Europe, Australia and America and then further divided into customer service, reliability and quality of supply standards. If breaches of these minimum performance standards involves (or proposes to involve) financial penalties then the amount has been indicated in brackets.

Abbreviations have been used in these tables to subdivision consumers by the amount of energy they use, and include:

- LV Low voltage customers;
- MV Medium voltage customers;
- HV High voltage customers; and
- EHV Extra high voltage customers.

A.1. Europe

Customer Service Quality Standards – Europe Electricity Distribution Sector					
Service	**Italy**	**Netherlands**	**Portugal[1]**	**Spain**	**United Kingdom**
Connection (supply and meter)	Connection with no work necessary: • 5 working days LV (€25) • 10 working days MV (€50) Connection with simple works: • 15 days for LV (€25) Reconnecting supply: • Within 1 working day (incl. Saturday)		Restoring supply after disconnection caused by customer: • 5pm next working day LV customers • Within 8hrs non-LV customers (€14.96 LV up 20.7kVA, €24.94 other LV customers, €74.42 for MV and HV)	Connection of supply • Within 5 days of contract signing (maximum of either €30 or 10% of bill) Reconnecting supply • Within 24 hrs of payment of bill (maximum of either €30 or 10% of bill)	• 2 working days domestic (£20 – 100) • 4 working days non-domestic (£20-100)

[1] Payment is after customer claim

Customer Service Quality Standards – Europe Electricity Distribution Sector					
Service	**Italy**	**Netherlands**	**Portugal[1]**	**Spain**	**United Kingdom**
Providing an estimation for work charges	15 working days for simple works to LV customers (€25)			LV new supplies • 5 days for <15 kW supplies • 10 days for other supplies without substation investment • 20-30 days for other supplies with substation investment. MV & HV new supplies: • 40 days for supplies of 1-66kV • 60 days for supplies above 66kV.	• 5 days simple job (£40) • 15 days other jobs (£40)
Notice of supply interruption				Within 24 hrs of interruption (maximum of either €30 or 10% of bill)	• 5 days notice (£20 domestic £40 non-domestic)
Meter problems			Visit within 20 working days • €14.96 LV up 20.7kVA, • €24.94 other LV customers, • €74.42 for MV and HV	• Customers < 15 kW within 5 working days • 15 working days for the rest	Visit within 7 days or reply with 5 days (£20)

Customer Service Quality Standards – Europe Electricity Distribution Sector					
Service	**Italy**	**Netherlands**	**Portugal[1]**	**Spain**	**United Kingdom**
Queries on charges and payments			Reply within 20 days • €14.96 LV up 20.7kVA, • €24.94 other LV customers, • €74.42 for MV and HV		Reply and refunds with 5 working days (£20)
Appointment scheduling	With 3 hrs range (€25 LV and €50 MV)		Within 3 hrs range • €14.96 LV up 20.7kVA, • €24.94 other LV customers, • €74.42 for MV and HV		AM or PM appointment, or timed if requested (£20)
Notifying and paying consumers under the standard					Write and pay within 10 working days (£20)
Disconnection on request	• 5 working days LV (€25) • 7 working days MV (€50)			Within one month	
Response to customer claims				• Customers < 15 kW within 5 working days • 15 working days for the rest	

Reliability of Supply Indicators in Electricity Distribution - Duration of Single Outage				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Italy	LV users* • Maximum time to restore supply after single-user faults. To be determined by regulator MV and HV users* • Maximum time to restore electricity supplies after faults To be determined by regulator	Payments to individuals paid automatically	• Acts of God • User's or third party's responsible for outage	• Regional Courts • Regulatory body
Netherlands	All supply must be restored within four hours	Payments to individuals paid automatically (€35)	None	• National Dispute Settlement Committee • Competition Authority
Norway	None			
Portugal	Respond to failure of suppliers' fuse within 4 hrs (5 hrs for rural customers)*	Payments to individuals paid by claim • €14.96 LV up 20.7kVA, • €24.94 other LV customers, • €74.42 for MV and HV	None	Regulatory body

* Proposed minimum standard

Reliability of Supply Indicators in Electricity Distribution - Duration of Single Outage				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Spain	None			
United Kingdom	Respond to failure of suppliers' fuse within 3 hrs on working day, 4 hrs on any day with notification. Restoring supplies within 18 hrs of fault.	£20 payment to individuals paid automatically £50 domestic (£100 non-domestic) automatic payment, plus £25 for each additional 12 hrs not supplied.	Open to determination of regulator and companies can claim exceptional circumstances (not defined)	Gas and Electricity Customers' Committees

Reliability of Supply Indicators in Elec. Distribution - Frequency of non momentary outages per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Italy	Not Used			
Netherlands	Not Used			

Reliability of Supply Indicators in Elec. Distribution - Frequency of non momentary outages per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Norway	Not Used			
Portugal	Maximum number of disruptions for LV customers* • 12 (localities with 25,000+ customer) • 26 (localities with 5000-25000 customers) • 46 (localities with less than 5000 customer) Maximum number of disruptions for MV customers* • 8 (localities with 25,000+ customer) • 20 (localities with 5000-25000 customers) • 40 (localities with less than 5000 customer) Maximum of 8 interruptions for HV customers* Maximum of 3 interruptions for EHV customers*	Penalty is proportional to number of interruptions above minimum standard. Penalties are paid on customer claims.	Only for interruptions above 3 mins. and excludes: • fortuitous reasons or force majeure, • service reasons, • public interest, • safety reasons, • facts attributable to client, • agreements with client.	

* Proposed minimum standard

Reliability of Supply Indicators in Elec. Distribution - Frequency of non momentary outages per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Spain	Maximum number of disruptions for LV customers* • 12 (region with 20,000+ customers) • 15 (regions with 2,000 to 20,000 customers) • 18 (regions with 200 to 2,000 customers • 24 (regions with less than 200 customers) Maximum number of Disruptions for MV customers* • 8 (region with 20,000+ customers) • 12 (regions with 2,000 to 20,000 customers) • 16 (regions with 200 to 2,000 customers • 20 (regions with less than 200 customers)	Automatic reduction in customer bills based on the number of interruptions above guaranteed standard.	Only for interruptions above 3 mins., and excludes: • acts of god, • third party actions	
United Kingdom[2]	Maximum number of interruptions per customer* • 3 interruptions of more than 3 hrs each	Payment of £50 paid by claim	Open to determination of regulator and companies can claim exceptional circumstances (not defined)	Gas and Electricity Customers' Committees

* Proposed minimum standard

Reliability of Supply Indicators – Cumulative hours not supplied per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Italy	Not used			
Netherlands	Not used			

[2] Development of Multiple Interruptions and Other Standards for Electricity Distribution – Initial Proposal, Ofgem November2001

Reliability of Supply Indicators – Cumulative hours not supplied per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Norway	Not used			
Portugal	Maximum hours of interruption for LV customers* • 6 (localities with 25,000+ customer) • 10 (localities with 5000-25000 customers) • 25 (localities with less than 5000 customer) Maximum hours of interruption for MV customers* • 4 (localities with 25,000+ customer) • 8 (localities with 5000-25000 customers) • 20 (localities with less than 5000 customer)	Based on number of hours of interruptions above standard and are by claim	Only for interruptions above 3 mins., and excludes: • fortuitous reasons or force majeure, • service reasons, • public interest, • safety reasons, • facts attributable to client, • agreements with client.	

* Proposed minimum standard

Reliability of Supply Indicators – Cumulative hours not supplied per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Spain	Maximum hours of interruption for LV customers* • 6 (region with 20,000+ customers) • 10 (regions with 2,000 to 20,000 customers) • 15 (regions with 200 to 2,000 customers • 20 (regions with less than 200 customers) Maximum hours of interruption for MV customers* • 4 (region with 20,000+ customers) • 8 (regions with 2,000 to 20,000 customers) • 12 (regions with 200 to 2,000 customers • 16 (regions with less than 200 customers)	Automatic reduction in customer bills based on the number of hours of interruptions above guaranteed standard	Only for interruptions above 3 mins., and excludes: • acts of god, • third party actions	
United Kingdom	Not used			

* Proposed minimum standard

Quality of Supply: Voltage minimum standard					
Voltage Quality	**Italy**	**Netherlands**	**Portugal**	**Spain**	**United Kingdom**
Voltage complaints			Visit or reply with 20 working days • €14.96 LV up 20.7kVA, • €24.94 other LV customers, • €74.42 for MV and HV	• Customers < 15 kW within 5 working days • 15 working days for the rest	Visit within 7 days or reply with 5 days (£20)

Minimum Service Standards – UK Gas Distribution Sector	
Standard	**United Kingdom[3]**
Unplanned interruptions to supply	24 hrs to restore supply and a fixed compensation payment of £30 for each day longer than the standards up to £1000 per customer.
Reinstatement of supply after planned interruption for re-laying of service pipes	10 working days after completion of re-laying of service pipes (for each subsequent period of 5 days: £50 domestic, £100 non-domestic)
Appointment scheduling	AM or PM appointments and must give 24 hours notice of inability to attend (£20)
Alternative heating and cooking facilities	Disconnections for safety reasons gas transporters will provide alternative facilities for disabled, chronically sick, pensioners and where children are in poverty. (£24)
Notifying customer of payments under the standard	20 working days to inform and pay consumer of any breach of these standards (£20)
Quotes for single connections+	Connections using less than 73,200 kWh: • No site visit (3days £30 / 10 days £40); • Site visit required (8 days £30 / 15 days £40). Connections using greater than 73,200 kWh: • No reinforcement required (8 days £50 / 15 days £65); • Reinforcement required (15 days £50 / 25 days £65).
Quotes for multiple meters+	• New housing 15 days (£50) / 25 days (£65)

[3] Regulations will come into effect for Independent Gas Transporters (IGTs) in April 2002 while Transco already has these standards in place.

Minimum Service Standards – UK Gas Distribution Sector	
Standard	**United Kingdom[3]**
Quotes to connect a self lay pipe[+]	• Requiring no reinforcement 8 days (£50) / 15 days (£65) • Requiring reinforcement 12 days (£50) / 25 days (£65)
Response to land enquiry from shipper, supplier or developer[+]	• 5 days (£30) / 15 days (£40)
Initial self lay enquiry[+]	• 5 days (£30) / 15 days (£40)

[+]Transco only

A.2. Australia

Customer Service Quality Standards – Australian Electricity Distribution Sector				
Service	**Victoria**	**South Australia**	**Queensland[4]**	**Tasmania**
Connection (supply and meter)	Supply must be on agreed date otherwise automatic payment ($50 per day up to $250).	Supply to a new supply address within 6 working days ($50 per day up to $250)	• Within 4 hrs or by agreement if electricity has already been supply to premises. ($20 pre day up to $200) • LV supply to premises not connected within 3 working days. ($20 pre day up to $200) • Where electricity mains need to be installed contact will be made within 10 days advising what work is requires. ($20 pre day up to $200)	• Next day connection if supply is unchanged. • On agreed date if supply requires construction of new lines. • On agreed date for new premises when is ready for connection, if no date is agreed then within ten business days of notification ($30 per business day up to $150 automatic payment)

[4] No legislated guaranteed service standards. The standard is voluntary but monitored by the regulatory body.

Customer Service Quality Standards – Australian Electricity Distribution Sector				
Service	**Victoria**	**South Australia**	**Queensland[4]**	**Tasmania**
Notice of supply interruption		• 4 days in writing or public announcement (no penalty)	• 2 business days notice. ($20)	• Written notice – 4 days, or • Public notices - 5 days. ($30 automatic payment)
Voltage complaints			• Investigate and respond with 10 business days. ($20) • If it involves a safety risk will respond immediately. (20)	
Appointment scheduling	If more than 15 minutes late for appointment with customer $20 automatic payment.	If more than 15 minutes late for appointment with customer $15 automatic payment.	If more than 15 minutes late for appointment with customer $20 automatic payment.	
Response to customer claims				Respond within ten working days ($30 automatic payment)

Customer Service Quality Standards – Australian Electricity Distribution Sector				
Service	**Victoria**	**South Australia**	**Queensland[4]**	**Tasmania**
Repair of street lighting		• 5 days in metropolitan areas • 10 days in rest of state ($20 for each period in which the light is not repaired)		Prompt repairs to street lights: • Repairs with seven working days ($30 per business day up to $150)

Reliability of Supply Indicators - Duration of Single Outage				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Victoria, Australia	• No greater than 12 hours non supply per single outage; • Applied at individual customer level rather than region; • No differentiation between regions (ie, same standard for rural and city); • Does not apply to large customers (above 1600MWh per annum. • Standard is static (ie, does not depend on relative performance compared to other distributors and does not automatically increase as average performance increases); • Applies to all outages (planned or unplanned).	• monetary penalty; • $80 penalty per breach; • Payment to affected customer; • Payment is automatic not customer initiated; • If utility is unsure which customers are affected it must either ascertain who was affected or pay penalty to all customers that were potentially affected;	• Exclusions for certain limited events “beyond the control” of the utility; • Utility must be able to show that it was unable to mitigate against the impact of the event;	None

Reliability of Supply Indicators - Duration of Single Outage				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
South Australia	Not used			
Tasmania	Not used			
Queensland[5]	• 3 hrs for high energy demand areas such as CBD customers • 12 hrs for urban customers • 18 hrs for rural customers	No penalty scheme in place		

[5] No legislated guaranteed service standards. The standard is voluntary but monitored by the regulatory body.

Reliability of Supply Indicators - Frequency of non momentary outages per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Victoria, Australia	• Non momentary interruption is one lasting greater than 1 minute; • No greater than 9 interruptions for urban customers. No greater than 15 interruptions per rural customer. • Applied at individual customer level rather than regional level; • Does not apply to large customers (above 1600MWh per annum. • Standard is static (ie, does not depend on relative performance compared to other distributors and does not automatically increase as average performance increases); • Does not include planned outages.	• Non momentary interruption is one lasting greater than 1 minute; • No greater than 9 interruptions for urban customers. No greater than 15 interruptions per rural customer. • Applied at individual customer level rather than regional level; • Does not apply to large customers (above 1600MWh per annum. • Standard is static (ie, does not depend on relative performance compared to other distributors and does not automatically increase as average performance increases); • Does not include planned outages.	• Exclusions for certain limited events “beyond the control” of the utility; • Utility must be able to show that it was unable to mitigate against the impact of the event;	
South Australia	Not used			

Reliability of Supply Indicators - Frequency of non momentary outages per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Tasmania	• No minimum for unplanned interruptions • Planned Interruptions notice must be provided four days by written notice or five days by media notice	• $30 automatic payment if standard if breached	• Standard is in approved standard contract.	• The Electricity Ombudsman
Queensland	Not used			

Reliability of Supply Indicators - Energy/Cumulative hours not supplied per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Victoria	Not used			
South Australia	Not used			
Tasmania	Not Used			
Queensland	Not used			

Quality of Supply: Voltage minimum standard			
Voltage Quality	**Victoria**	**South Australia**	**Tasmania**
	Not used	Not used	Not used

A.3. America

Customer Service Quality Standards – America Electricity Sector			
Service	**Massachusetts6**	**Maine***	**Kansas***
Connection (supply and meter)			• On agreed date ($US 100 per day up $ US 500)
Notice of supply interruption	• Customer must be notified of any scheduled service outages.[7] ($US25)		• Advance notice when interruption is known ($US 25)
Queries on charges and payments	• Failure to respond to billing question by next billing day ($US 25)		• Prompt answers to rate options, products and services ($US 25)
Appointment scheduling	• Failure to keep appointment or over 4 hours late[8] ($US 25)	• Keeping appointments or notifying customer of change at least 4 hours in advance ($US 25).	• Keeping appointments ($US 25)

[6] All standards are voluntary except where indicated

[*] Voluntary guaranteed service levels

[7] June 2001 order of the Department of Telecommunications and Energy

[8] June 2001 order of the Department of Telecommunications and Energy

Customer Service Quality Standards – America Electricity Sector			
Service	**Massachusetts6**	**Maine***	**Kansas***
Billing a accuracy	• Inaccurate meter reading ($US25) • Error in direct payment or phone payment system ($US25)	• If mistake is brought to companies attention bill will be corrected and, payment of the error up to $ US 10.	• Meter will be read correctly and billed accurately (lower of either, 10% of the corrected amount up to $ US 100 or the amount of the error)

Reliability of Supply Indicators - Duration of Single Outage				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Massachusetts	None			
Maine	None			
Kansas	None			

Reliability of Supply Indicators - Frequency of non momentary outages per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Massachusetts	None			
Maine	None			
Kansas	None			

Reliability of Supply Indicators – Energy/Cumulative hours not supplied per annum				
Jurisdiction	**Minimum Standard Description**	**Penalty Scheme Description**	**Exclusions Description**	**Dispute Resolution Procedures**
Massachusetts	None			
Maine	None			
Kansas	None			

Quality Of Supply: Voltage Minimum Standard			
Voltage Quality	**Massachusetts**	**Maine**	**Kansas**
	None	None	None

Guaranteed Service Levels – America Gas Distribution Sector			
Service	**Massachusetts**[9]	**Maine**	**Kansas**
Appointment scheduling	• Failure to keep appointment or over 4 hours late[10] ($US 25)	None	None
Notice of supply interruption	• Customer must be notified of any scheduled service outages.[11] ($US 25)	None	None
Billing a accuracy	• Inaccurate meter reading ($US 25) • Error in direct payment or phone payment system ($US 25)	None	None
Queries on charges and payments	• Failure to respond to billing question by next billing day ($US 25)	None	None

[9] All standards are voluntary except where indicated

[10] June 2001 order of the Department of Telecommunications and Energy

[11] June 2001 order of the Department of Telecommunications and Energy