# Performance Based Regulation of Privately Owned Distribution Utilities

## Framework for the Performance Incentive Scheme to apply from the Third Regulatory Period

**March 1, 2006**

# Performance Based Regulation of Privately Owned Distribution Utilities

# Framework for the Performance Incentive Scheme to apply from the Third Regulatory Period

## TABLE OF CONTENTS

# 1. INTRODUCTION

In terms of clause 4.18 of the Distribution Wheeling Rate Guidelines (DWRG) issued by the Energy Regulatory Commission (ERC) on December 20, 2004, a performance incentive scheme will be implemented that rewards each Regulated Entity for achieving specified performance target levels, and penalizes it for failing to achieve specified target levels. This incentive scheme is further described in Article VIII of the DWRG.

As noted in clause 9 of its Position Paper on the Regulatory Reset for the Second Regulatory Period[1], this incentive scheme will be applied for the Second Regulatory Period which will commence on July 1, 2007.

However, during the consultations on the Regulatory Reset Issues Paper, it became clear that serious shortcomings exist in the performance standards currently measured and the performance measurement information collected by Regulated Entities for Distribution Systems. The levels of performance information that can be provided for each Regulated Entity also vary greatly. It was therefore decided that for the Second Regulatory Period, an interim performance incentive scheme will be adopted, as described below.

At the same time, it was decided that a framework would be prepared for the eventual performance incentive scheme that would apply from the third regulatory period forward and that this framework would be communicated to the Regulated Entities to provide them with guidance in designing the interim performance incentive schemes. This document provides the framework for the eventual performance incentive scheme.

## 1.1 Consultation on the performance incentive scheme framework

It is not intended to conduct a formal consultation process on this document. The reasons for this are as follows :

a) The framework provided below is similar to the description of the performance incentive scheme included in the Position Paper, with some additional definitions and descriptions added. This Position Paper was the outcome of a full consultation process.

b) The purpose of this document is to provide guidance to Regulated Entities in preparing their own interim performance incentive schemes for the Second Regulatory Period but does not prescribe the format of these schemes. The interim performance schemes suggested by Regulated Entities will form part of their price applications under Performance Based Regulation (PBR) and will undergo a full hearing process as part of that process.

c) It is the intention of the ERC to issue a revised version of the DWRG before June 2006. This revised version will include this framework for the performance incentive scheme and it will undergo a full consultation process before being finalized.

[1] ERC Publication *"Position Paper on the Regulatory Reset Process for the Second Regulatory period"* dated December 9, 2005.

## 1.2 Note on definitions used

The definitions of capitalized terms used in this paper are similar to that described in clause 1.2 of the Position Paper.

However, for the purposes of defining the performance indices described in this paper, certain further terms are defined in Appendix A. These are mainly technical in nature and where contradictions are found between these definitions and that in the Position Paper, for the purposes of calculating the performance indices the definitions in this paper should take precedence. For all other purposes, the definitions described in the Position Paper should take precedence.

# 2. OVERVIEW OF THE FINAL INCENTIVE SCHEME

The performance incentive scheme that will apply for the third regulatory period (the Final Scheme) will have three main streams, as described below.

a) Price-linked incentive scheme

The performance of Regulated Distribution Systems will be assessed against a number of network performance and service performance measures.[2] If performance levels exceed predetermined targets, Regulated Entities will be financially rewarded or, if performance levels fail to meet predetermined performance targets, Regulated Entities will be financially penalized.

The reward or penalty will take the form of an additional S-factor to be used in the calculation of the maximum average price-cap. The S-factor will be a weighted performance measure, based on the performance levels achieved against a number of indices over the calendar year preceding each Regulatory Year.

b) Guaranteed Service Levels

A system of Guaranteed Service Levels (GSLs) will be introduced for each Regulated Distribution System, in terms of which customers will receive certain guarantees with regard to the responsiveness and effectiveness of Regulated Entities. If these GSLs are not met, predetermined penalties will be paid by the Regulated Entities directly to customers.

c) Information disclosure

The performance of Regulated Distribution Systems against a further number of performance indices (network and service related) will be regularly measured and published.

## 2.1 Price-linked incentives

### *2.1.1 Capturing the performance rewards or penalties*

For the direct reward-based incentives, the price-cap formula (clause 4.2.1 of the DWRG) will be adapted with an S-factor, as follows:

$$MAP_t = [MAP_{t-1} \times \{1 + CWI_t - X\}] + S_t - K_t + ITA_t$$

where $S_t$ is the performance incentive factor calculated as described in section 2.1.3 below. This factor can be zero, positive or negative, depending on whether actual performance against the (weighted) majority of the indices has exceeded the performance target discussed below or has fallen below these.

The calculation of the performance targets will initially be largely based on historical actual performance levels by Regulated Distribution Systems.

[2] Network performance measures refer to those indices measured directly in terms of Distribution System performance, usually expressed as technical factors. Service performance measures refer to those indices relating directly to the performance of the staff supporting the operation of the Distribution System, usually expressed in terms of the time taken to complete actions, or the number of times actions exceeded or missed target levels.

### *2.1.2 Service performance indices to be measured*

For the Final Scheme, the following service performance indices will be included in the S-factor:

Network Performance Measures

a) System average interruption frequency index (SAIFI). A measure of the average number of sustained service interruptions experienced per customer over the measurement period.

b) Customer average interruption duration index (CAIDI). A measure of the average duration of sustained service interruptions over the measurement period.

c) Planned system average interruption duration index (SAIDI). A measure of the average duration of planned sustained service interruptions for all customers over the measurement period.

d) Voltage regulation. A measure of the probability of Distribution System voltage levels falling outside the boundaries prescribed in the Distribution Code.

e) System losses. An indication of total losses on a Regulated Distribution System, including technical and non-technical losses (but excluding administrative losses).

Service performance measures

f) Time to process applications for Regulated Distribution Services.

g) Time to connect premises to the Regulated Distribution System after compliance with all government and Regulated Entity requirements.

h) Percentage of calls answered at the call center (or equivalent) within a predetermined time.

The final definition and calculation of the various indices are discussed in appendix A.

The ERC will eventually widen the Distribution Code definition of SAIDI, SAIFI and CAIDI to include outages on at least the larger secondary lines of a Distribution System. This will not include outages to single or small groups of customers,[3] but outages on major low voltage lines or distribution transformers should be included.

Regulated Entities already face a downside potential from the system loss cap that is imposed on Regulated Distribution Systems. It is therefore the intention that the system loss performance index will not have a negative measure– it will be zero or positive only.

The ERC recognizes that not all Regulated Entities may have formal call centers to respond to customer queries. Such a center, or an equivalent arrangement is however considered a fundamental requirement for providing efficient customer service and it is therefore encouraged by means of the incentive scheme.

### *2.1.3 Calculation of the S-factor*

The S-factor will be based on a weighted sum of performance components, one for each of the indices discussed in section 2.1.2. It will be calculated as follows:

[3] Such outages are unlikely to register on the network wide SAIDI or SAIFI statistics in any case.

$$S_t = \frac{[S_{SAIFI,t} + S_{CAIDI,t} + S_{SAIDI,t} + S_{VoltViol,t} + S_{Sysloss,t} + S_{Proc,t} + S_{Con,t} + S_{Call,t}] \times 0.025 ARR_t}{FQ_t}$$

where,

$ARR_t$ = the allowed annual revenue for Regulatory Year t calculated in accordance with clause 4.7.7 of the DWRG;

$FQ_t$ = the total amount of energy (expressed in kWh) that is forecast to be delivered to Connection Points through the relevant Regulated Distribution System during Regulatory Year t, with the forecast as approved by the ERC;

and

$S_{SAIFI,t} = W_{SAIFI} \times Perf_{SAIFI,t-1}$

where, $S_{SAIFI,t}$ = S-component for SAIFI for Regulatory Year t;

$W_{SAIFI}$ = Weighting given to the SAIFI S-component; and

$Perf_{SAIFI,t-1}$ = SAIFI performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$S_{CAIDI,t} = W_{CAIDI} \times Perf_{CAIDI,t-1}$

where, $S_{CAIDI,t}$ = S-component for CAIDI for Regulatory Year t;

$W_{CAIDI}$ = Weighting given to the CAIDI S-component; and

$Perf_{CAIDI,t-1}$ = CAIDI performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$S_{SAIDI,t} = W_{SAIDI} \times Perf_{SAIDI,t-1}$

where, $S_{SAIDI,t}$ = S-component, planned SAIDI for Regulatory Year t;

$W_{SAIDI}$ = Weighting given to the SAIDI S-component; and

$Perf_{SAIDI,t-1}$ = Planned SAIDI performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$S_{VoltViol,t} = W_{VoltViol} \times Perf_{VoltViol,t-1}$

where, $S_{VoltViol,t}$ = S-component for voltage regulation performance for Regulatory Year t;

$W_{VoltViol}$ = Weighting given to the voltage regulation S-component; and

$Perf_{VoltViol,t-1}$ = Voltage regulation performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$$S_{Sysloss,t} = W_{Sysloss} \times Perf_{Sysloss,t-1}$$

where, $S_{Sysloss,t}$ = S-component for system losses performance for Regulatory Year t;

$W_{Sysloss}$ = Weighting given to the system losses S-component; and

$Perf_{Sysloss,t-1}$ = System losses performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$$S_{Proc,t} = W_{Proc} \times Perf_{Proc,t-1}$$

where, $S_{Proc,t}$ = S-component for time to process applications for Regulatory Distribution Services for Regulatory Year t;

$W_{Proc}$ = Weighting given to the process time S-component; and

$Perf_{Proc,t-1}$ = Process time performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$$S_{Con,t} = W_{Con} \times Perf_{Con,t-1}$$

where, $S_{Con,t}$ = S-component for time to provide connection to the Regulated Distribution System for Regulatory Year t;

$W_{Con}$ = Weighting given to the service connection time S-component; and

$Perf_{Con,t-1}$ = Connection time performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

$$S_{Call,t} = W_{Call} \times Perf_{Call,t-1}$$

where, $S_{Call,t}$ = S-component for call-center performance for Regulatory Year t;

$W_{Call}$ = Weighting given to the call-center performance S-component; and

$Perf_{Call,t-1}$ = Call-center performance assessment for the calendar year ending on December 31 of Regulatory Year t-1.

For the sake of clarity it should be noted that the years referred to in this section are Regulatory Years, not calendar years. For example, if the Regulatory Year 2009 is considered, that is the period starting on July 1, 2008 till June 30, 2009. For this Regulatory Year 2009, reference to a calendar year ending on December 31 of the

Regulatory Year t-1, would refer to December 31, 2007. This allows a full year of recent performance data to be considered for setting the S-factor.

### *2.1.4 Weighting of the performance indices*

In clause 8.2.3 (c) of the DWRG, it is specified that the total level of the rewards or penalties under the performance incentive scheme for any Regulatory Year should not exceed 3 % of the allowed annual revenue for a Regulated Distribution System for that year. As the performance incentive scheme will have two streams involving possible changes to the annual revenue that can be earned, the following ceilings will apply to these streams:

a) The maximum value of the direct reward-based incentive scheme in any year will be capped at 2.5% of the allowed annual revenue.

b) The revenue allowance for the GSL scheme will be set at 0.5 % of the annual allowed revenue in any Regulatory Year as calculated before the GSL scheme is taken into account.

The ceiling on the direct reward-based incentive scheme is already accounted for in the formulas to calculate the S-factor, as described in section 2.1.3 above. Based on the relative importance of these indices, the extent to which they can be influenced by Regulated Entities and the ability of Regulated Entities to effectively measure them, the weightings set out in table 1 will be applied to the various performance S-components.

**Table 1 : Weightings for the S-components**

| Component | Symbol | Weighting |
|---|---|---|
| SAIFI | $W_{SAIFI}$ | 0.20 |
| CAIDI | $W_{CAIDI}$ | 0.20 |
| Planned SAIDI | $W_{SAIDI}$ | 0.15 |
| Voltage regulation | $W_{VoltViol}$ | 0.10 |
| System losses | $W_{Sysloss}$ | 0.05 |
| Time to process applications | $W_{Proc}$ | 0.10 |
| Time to connect premises | $W_{Con}$ | 0.10 |
| Call-center performance | $W_{Call}$ | 0.10 |

### *2.1.5 Determination of the performance targets for the various performance indices*

The proposed methodology to determine the performance targets is discussed below. Regulated Entities are required to collect information about the performance levels of their Regulated Distribution Systems against these indices over the Second Regulatory Period. This data will be used when determining the final performance bands for the incentive scheme to be implemented during the third regulatory period.

It is the intention to set five discrete performance bands for each performance index, as illustrated in table 2 below. Performance in each of these bands would result in the

allocation of a simple performance assessment value to the index being assessed. These are the "Perf"-values described in section 2.1.3.

**Table 2 : Proposed performance assessment bands**

| Performance band | Description | Performance value |
|---|---|---|
| 1 | Performance greatly below target | -1.0 |
| 2 | Target not achieved | -0.5 |
| 3 | Performance as per expectation | 0 |
| 4 | Target exceeded | 0.5 |
| 5 | Target greatly exceeded | 1.0 |

The manner in which the bands will be set for each performance index is described in table 3 (a-g) below.

**Table 3a : Setting of performance bands for SAIFI performance**

| SAIFI | |
|---|---|
| Average SAIFI value | Average annual SAIFI for a Regulated Distribution System for the Second Regulatory Period |
| Standard deviation | Standard deviation of the annual SAIFI values for a Regulated Distribution System for the 10 calendar years ending on Dec 31, 2010 |
| Performance greatly below target | Annual SAIFI more than 2 standard deviations above the SAIFI average |
| Target not achieved | Annual SAIFI more than 1 standard deviation, but less than 2 standard deviations, above the SAIFI average |
| Performance as per expectation | Annual SAIFI between 1 standard deviation above and 1 standard deviation below the average value |
| Target exceeded | Annual SAIFI more than 1 standard deviation, but less than 2 standard deviations, below the SAIFI average |
| Target greatly exceeded | Annual SAIFI more than 2 standard deviations below the SAIFI average |

**Table 3b : Setting of performance bands for CAIDI performance**

| CAIDI | |
|---|---|
| Average CAIDI value | Average annual CAIDI for a Regulated Distribution System for the Second Regulatory Period |
| Standard deviation | Standard deviation of the annual CAIDI values for a Regulated Distribution System for the 10 calendar years ending on Dec 31, 2010 |
| Performance greatly below target | Annual CAIDI more than 2 standard deviations above the CAIDI average |
| Target not achieved | Annual CAIDI more than 1 standard deviation, but less than 2 standard deviations, above the CAIDI average |
| Performance as per expectation | Annual CAIDI between 1 standard deviation above and 1 standard deviation below the average value |
| Target exceeded | Annual CAIDI more than 1 standard deviation, but less than 2 standard deviations, below the CAIDI average |
| Target greatly exceeded | Annual CAIDI more than 2 standard deviations below the CAIDI average |

**Table 3c : Setting of performance bands for planned SAIDI performance**

| PLANNED SAIDI | |
|---|---|
| Average planned SAIDI value | Average annual planned SAIDI for a Regulated Distribution System for the Second Regulatory Period |
| Standard deviation | Standard deviation of the annual planned SAIDI values for a Regulated Distribution System for the 10 calendar years ending on Dec 31, 2010 |
| Performance greatly below target | Annual planned SAIDI more than 2 standard deviations above the planned SAIDI average |
| Target not achieved | Annual planned SAIDI more than 1 standard deviation, but less than 2 standard deviations, above the planned SAIDI average |
| Performance as per expectation | Annual planned SAIDI between 1 standard deviation above and 1 standard deviation below the average value |
| Target exceeded | Annual planned SAIDI more than 1 standard deviation, but less than 2 standard deviations, below the planned SAIDI average |
| Target greatly exceeded | Annual planned SAIDI more than 2 standard deviations below the planned SAIDI average |

**Table 3d : Setting of performance bands for voltage regulation performance**

| VOLTAGE REGULATION | |
|---|---|
| Target probability of voltage violation ($pV_v$) | 4% |
| Performance greatly below target | Probability of voltage violation greater than or equal to 6% |
| Target not achieved | Probability of voltage violation between 5% and 6% |
| Performance as per expectation | Probability of voltage violation on or between 3% and 5% |
| Target exceeded | Probability of voltage violation between 2% and 3% |
| Target greatly exceeded | Probability of voltage violation less than or equal to 2% |

**Table 3e : Setting of performance bands for system losses**

| SYSTEM LOSSES | |
|---|---|
| Target for system losses | 9.5% |
| Performance greatly below target | Not applicable |
| Target not achieved | Not applicable |
| Performance as per expectation | System losses on or between 8.5% to 9.5% |
| Target exceeded | System losses between 7.0% and 8.5% |
| Target greatly exceeded | System losses less than or equal to 7.0% |

**Table 3f : Setting of performance bands for time to process applications**

| TIME TO PROCESS SERVICE APPLICATIONS | |
|---|---|
| Long-term average time to process a service application | Average application processing time over the Second Regulatory Period |
| Standard deviation | Standard deviation of the average time to process applications, based on actual cases for the Second Regulatory Period |
| Performance greatly below target | Annual average processing time more than 2 standard deviations above the long-term average value |
| Target not achieved | Annual average processing time more than 1 standard deviation, but less than 2 standard deviations, above the long-term average value |
| Performance as per expectation | Annual average processing time between 1 standard deviation above and 1 standard deviation below the long-term average value |
| Target exceeded | Annual average processing time more than 1 standard deviation, but less than 2 standard deviations, below the long-term average value |
| Target greatly exceeded | Annual average processing time more than 2 standard deviations below the long-term average value |

**Table 3g : Setting of performance bands for time to provide connection**

| TIME TO PROCESS SERVICE APPLICATIONS | |
|---|---|
| Long-term average time to provide a connection | Average time to provide a connection over the Second Regulatory Period |
| Standard deviation | Standard deviation of the average time to provide a connection, based on actual cases for the Second Regulatory Period |
| Performance greatly below target | Annual average connection time more than 2 standard deviations above the long-term average value |
| Target not achieved | Annual average connection time more than 1 standard deviation, but less than 2 standard deviations, above the long-term average value |
| Performance as per expectation | Annual average connection time between 1 standard deviation above and 1 standard deviation below the long-term average value |
| Target exceeded | Annual average connection time more than 1 standard deviation, but less than 2 standard deviations, below the long-term average value |
| Target greatly exceeded | Annual average connection time more than 2 standard deviations below the long-term average value |

**Table 3h : Setting of performance bands for call center performance**

| TIME TO PROCESS SERVICE APPLICATIONS | |
|---|---|
| Long-term average time to provide a connection | Average percentage of calls answered after 30 seconds over the Second Regulatory Period |
| Standard deviation | Standard deviation of the average percentage of calls answered after 30 sec., based on actual numbers for the Second Regulatory Period |
| Performance greatly below target | Annual average connection time more than 2 standard deviations above the long-term average value |
| Target not achieved | Annual average connection time more than 1 standard deviation, but less than 2 standard deviations, above the long-term average value |
| Performance as per expectation | Annual average connection time between 1 standard deviation above and 1 standard deviation below the long-term average value |
| Target exceeded | Annual average connection time more than 1 standard deviation, but less than 2 standard deviations, below the long-term average value |
| Target greatly exceeded | Annual average connection time more than 2 standard deviations below the long-term average value |

### *2.1.6 Excluded events*

There are a number of external events which can have a substantial impact on the actual performance of Regulated Distribution Systems against performance indices, but that are predominantly outside the control of Regulated Entities. The ERC will allow these events to be excluded from the statistics used to calculate network or service performance.

Events of which the impact on the performance of a Regulated Distribution System will generally be excluded are:

- supply interruptions made at the request of a customer;
- load shedding due to a shortfall in generation;
- supply interruptions caused by a failure of the transmission network;
- supply interruptions caused by a failure of a transmission connection asset, but only to the extent that the interruptions were not due to inadequate planning of transmission connections; and
- widespread supply interruptions due to rare and extreme events which were not reasonably able to be foreseen, or if they could be foreseen, for which the impact could still not be effectively mitigated even if appropriate responses were provided.

A Regulated Entity wishing to exclude the impact of a certain event from the calculation of the service performance incentive scheme would need to provide the ERC with the following:

- a detailed description of the nature of the event for which an exclusion is sought and the reasons justifying the exclusion of the event, including the provision of supporting evidence;
- evidence of the impact of the event on the Regulated Distribution System reliability performance, for each of the measures adversely affected;
- a description of the steps that the Regulated Entity took to mitigate against or respond to the events; and
- evidence that the Regulated Entity was unable to further mitigate against the impact of the event.

The ERC will adopt the 2.5 beta approach, developed by the Institute for Electrical and Electronic Engineers (IEEE) to identify major event days.[4]

Further tests will be applied to determine the main cause(s) for the major event days, isolating, where appropriate, the underlying event and formally classing it as “severe”. These tests include assessing the nature and rarity of an event, the ability to foresee and prepare for an event, the ability of distribution companies to mitigate the effects of an event, and the reaction of Regulated Entities after the event.

[4] IEEE Power Engineering Society. (2004, May). IEEE Std 1366TM – 2003. IEEE Guide for Electric Power Distribution Reliability Indices. New York, USA. Institute of Electronics and Electrical Engineers (IEEE)

If after this consideration the ERC approves the classification of an event as extreme, the impact of the event on the daily SAIDI (and other performance indices, as appropriate) would be excluded from the performance statistics used as part of the performance incentive scheme.

## 2.2 Guaranteed Service Levels

A GSL scheme will be introduced to Regulated Distribution Systems during the Second Regulatory Period. In terms of this scheme, Regulated Entities will compensate a consumer directly if certain service delivery performance thresholds are not met.

For the interim schemes proposed by Regulated Entities, the indices measured will be those suggested by them. From the third regulatory period onward, the indices described below will be used.

### *2.2.1 Proposed GSL indices and payment levels*

The indices that will be included in the GSL scheme, and indicative performance targets against these, are listed below. Actual targets will be established during the course of the Second Regulatory Period.

The proposed GSL measures, including indicative values for the thresholds are :

a) GSL1 : a Customer of a Regulated Distribution System experiencing more than 20 hours of sustained interruptions over any Regulatory Year;

b) GSL2 : a customer in an urban or sub-urban part of a Regulated Distribution System experiencing more than 20 sustained interruptions in a Regulatory Year;

c) GSL3 : restoration of service to a customer after a fault on the secondary side of a Regulated Distribution System, including the service drop, does not occur within 12 hours of the fault occurring; and

d) GSL4 : the Regulated Entity failing to provide a connection to a customer on the day promised, with cumulative payments applying for each day that a connection is later than promised.

It is stressed that the targets included above are indicative only and are not based on actual information submitted experience by Regulated Entities. Final targets will only be set during the Regulatory Reset Process for the third regulatory period based on the appropriate data been gathered from Regulated Entities over the course of the Second Regulatory Period.

### *2.2.2 Determining the penalty levels*

Setting appropriate GSL performance levels requires current information on actual performance against the indices. The ERC will collect the information from Regulated Entities over the Second Regulatory Period to determine the penalty levels that will apply when GSLs are not met.

The methodology that will be used to establish the penalty levels is as follows:

1. The ERC will calculate the total revenue allocation for the GSL scheme. As noted in section 2.1.4, this allocation will be calculated as 0.5 % of the allowed annual

revenue, as calculated before the scheme is implemented. Since it is intended to set constant penalty levels for the whole of the third regulatory period, these will be based on the revenue for Regulatory Year 2012 (the start of the period).

$$GSL\text{Rev} = 0.005 \times ARR_{2012}$$

where $ARR_{2012}$ is the allowed annual revenue for Regulatory Year 2012 calculated in accordance with clause 4.7.7 (carried forward to article VI for subsequent regulatory periods) of the DWRG

2. Based on the data submitted by the Regulated Entities, the ERC will assess the likely number of instances in a year that each of the penalty levels will be exceeded. For example, the number of customers likely to have faults exceeding 12 hours duration (GSL3) during Regulatory Year t would be $nGSL3$ .

3. By allocating the same weighting to all the proposed GSL indices, the revenue allocation will be made per index. For example, the revenue allocated to the GSL3 measure (restoration > 12 hours) would be :

$$GSL3\text{Rev} = 0.25 \times GSL\text{Rev}$$

4. The penalty amount will be calculated by dividing the revenue allocation for each index by the estimated number of times that the penalty level for that index is expected to be exceeded. For example, the penalty payable each time that an interruption on the secondary side of a Regulated Distribution System is not restored within 12 hours, would result in a penalty amount (rounded off) of :

$$PenGSL3 = \frac{GSL3\text{Rev}}{\text{nGSL3}}$$

### *2.2.3 Adapting revenue requirements*

It is intended to make an additional allowance over and above the allowed annual revenue for each Regulated Entity, to cover the anticipated amount that would be payable towards the GSL scheme. While this allowance will not be part of the allowed annual revenue (which is calculated based on the building blocks), it will be treated like an additional operating expense for each Regulatory Year for the purposes of setting the price caps that will apply over the Regulatory Period.

Regulated Entities who manage to perform better than forecasted against the GSL will be allowed to retain the savings on the extra revenue allowance, potentially also as part of their future efficiency adjustments. Conversely, those Regulated Entities that pay out more penalties than allowed for, will bear the additional cost, potentially also as part of their future efficiency adjustments. Since there is a cap of 3% of the annual allowed revenue for the total incentive scheme, and 2.5% of this cap is allocated for the price-linked incentive scheme, the maximum further downside that an under-performing Regulated Entity could face if it pays out more penalties than its historical performance would indicate, would be 0.5% of the annual allowed revenue for a particular year. (This is over and above the 0.5% GSL allowance which it would at that stage already have paid out.)

This intention of the 0.5% GSL allowance is to allow Regulated Entities the option of incurring additional expenditure to avoid penalty situations, or to remain revenue neutral if they maintain current performance levels.

### *2.2.4 Excluded events*

As with the price-linked incentive scheme, there are external events which can have a substantial impact on the actual performance of Regulated Entities against the GSL scheme, but that are predominantly outside their control. These events will be excluded from the scheme. The events that will be excluded are similar to that discussed earlier:

- supply interruptions made at the request of a customer;
- load shedding due to a shortfall in generation;
- supply interruptions caused by a failure of the transmission network;
- supply interruptions caused by a failure of a transmission connection asset, but only to the extent that the interruptions were not due to inadequate planning of transmission connections; and
- widespread supply interruptions due to rare and extreme events which were not reasonably able to be foreseen, or if they could be foreseen, for which the impact could still not be effectively mitigated even if appropriate responses were provided.

A Regulated Entity wishing to avoid a penalty payment arising as a result of one of these events has to notify the ERC and the affected customer(s) of the reason for this. In addition, the following details have to be provided to the ERC:

- a detailed description of the nature of the event for which an exclusion is sought and the reasons justifying the exclusion of the event, including the provision of supporting evidence;
- evidence of the impact of the event on the Regulated Distribution System reliability performance, for each of the measures adversely affected;
- a description of the steps that the Regulated Entity took to mitigate against or respond to the events; and
- evidence that the Regulated Entity was unable to further mitigate against the impact of the event.

The ERC will develop standard measures by which to assess whether the impact of an event was severe enough to cause the penalty to be disallowed.

After assessing whether a penalty can indeed be disallowed or should remain in place, the ERC will notify the Regulated Entity of its decision. It will be the responsibility of the Regulated Entity to further communicate the decision to the affected customer(s). If the ERC agrees with the Regulated Entity's assessment that an event should be excluded, no penalty payment will apply to that event.

## 2.3 Information disclosure

The third component of the performance incentive scheme is the measurement and disclosure of further performance data. From the third regulatory period, Regulated Entities will be required to measure the performance of each Regulated Distribution System against the following indices:

Network performance indices

a) momentary average interruption frequency index (MAIFI);

b) frequency of tripping events per 100 circuit-km;

Service performance indices

c) average time to respond to queries and complaints;

d) average time to reconnect a service after payment of all dues.

The information has to be collected and supplied to the ERC on a monthly basis. In addition to the monthly figures, the cumulative performance total against each index must also be provided, from the start of the corresponding calendar year till the end of the month for which each index was measured.

The ERC intends to annually publicize the information disclosure data for all Regulated Distribution Systems.

## 2.4 Measurement ability and details

It is essential that performance measurement information is both exhaustive and accurate.

As a minimum, Regulated Entities have to maintain detailed records of the following (in as far as it can be provided with current measuring equipment and systems):

- outages, describing the date, nature and class of outages, the duration, the parts of the network and customers affected and the cause of the incidents ;
- customer requests for services and other customer enquiries, including the time and date they were made, and the time and date of various milestones reached in processing them;
- technical quality measurements taken, including the date and position of measurements, the person(s) taking the measurements and the measurement results;
- all equipment used to take measurements on the network, including calibration and service details;
- log of calls received at the Regulated Entity's call centre; and
- details of all calculations made to prepare the quarterly data submission to the ERC.

## 2.5 Data required

Templates for the historical and the monthly performance data that has to be submitted to the ERC by Regulated Entities for each Regulated Distribution System is provided in Appendix B.

Given that the Regulated Entities will be working on Interim Schemes for the Second Regulatory Period, the monthly information provided during this period will be for the interim performance measures only and the attached templates are therefore to be used for guidance only.

# APPENDIX A : DEFINITION OF INDICES USED FOR THE PERFORMANCE INCENTIVE SCHEME

In this section, the various indices that will be used for the performance incentive scheme are defined and the method for their calculation is explained.

## A1. Definitions of terms for performance indices

The definitions given below are for the purposes of the measurement indices only and not intended to be general definitions for the DWRG or the Position Paper.[5]

**End-user**. Any person or entity requiring the supply and delivery of electricity for its own use.

**Excluded Event.** An event for which any resulting Interruption should be excluded from the performance data on which the calculation of the performance index is based. These Excluded Events are as described in section 2.1.6 above.

**Interruption.** The loss of service to one or more End-users.

**Long-duration Voltage.** The average root-mean-square (RMS) value of a voltage reading taken at a Measurement Point, where the reading is taken for a one (1) minute duration.[6]

**Measurement area.** The Distribution System for which a performance index is calculated.

**Measurement period.** The period over which a performance index is calculated.

**Measurement point.** A random point, anywhere on a Distribution System, at which a measurement is taken in order to test conformance with a prescribed service level.

**Momentary Interruption.** A single operation of an interrupting device that results in a voltage zero, causing a momentary loss of service (for less than five minutes) to one or more End-users.

**Notification date.** The date on which a notice is served to an applicant for a Regulated Distribution Service (including, for the purpose of this definition, applications for Distribution Connection Services). Such notice is deemed to be delivered on the day that notification is faxed or submitted by electronic mail, or three working days after such notice was posted using normal mail services.

**Outage.** The state of a component (or group of components) when it is not available to perform its intended function due to some event directly associated with that

[5] These definitions correspond as closely as practical with those in the Philippines Distribution Code and the IEEE standard 1366-2003 (IEEE Guide for Electric Power Distribution Reliability Indices)

[6] This assumes that a voltage recording device will be available that can provide an average voltage reading over a period. Where such a device is not present, the Long-duration Voltage can be approximated by taking five (5) instantaneous readings of the (true) RMS voltage value at a Measurement point at consecutive 15 second intervals and averaging these readings.

component (or group of components). An Outage may, or may not give rise to an Interruption.

**Planned Interruption.** An Interruption which results when a component or components of the Distribution System are deliberately taken out of service at a selected time and of which advance notice of at least three (3) working days is given to End-users, detailing the time the Interruption will occur and the anticipated duration of the Interruption.

**Primary side of Distribution System.** The portion of the Distribution System excluding the Secondary Side of the Distribution System. It includes subtransmission networks.

**Response date.** Date on which a response is received from an applicant for a Regulated Distribution Service (including, for the purpose of this definition, applications for Distribution Connection Services). Such notice is deemed to be received on the day that notification is faxed or submitted by electronic mail, or three working days after such notice was posted using normal mail services.

**Secondary side of Distribution System.** Distribution transformers and the low voltage network on the secondary side of distribution transformers, including Distribution Connection Assets.

**Sustained Interruption.** An Interruption with a duration of five minutes or longer.

**Tripping Event.** An event caused by the operation of an interrupting device on an electrical distribution circuit, where such operation is caused by an external event, not the deliberate operation of the device by an operator, and where the event gives rise to a sustained (five minutes or longer) Outage of the circuit.

**Unplanned Interruption.** Any Interruption which is not a Planned Interruption.

## A2. Price-related incentive scheme

### *A2.1 SAIFI*

Definition of index : System average interruption frequency index

Description : The average number of Sustained Interruptions experienced per End-user in the Measurement Area over the Measurement Period.

Calculation : The SAIFI is calculated with the following formula :

$$SAIFI = \frac{\sum N_i}{N_T}$$

where,

$N_i$ = Number of End-users experiencing Sustained Interruptions caused as a result of a single event *i*.

$\sum N_i$ = Total number of Sustained Interruptions experienced by End-users within the Measurement Period.

$N_T$ = Total number of End-users served in the Measurement Area (average over the Measurement Period).

Comments : i. The SAIFI calculation includes planned and unplanned interruptions.

ii. Only Sustained Interruptions are considered.

- SAIFI is to be calculated across the full End-user base, for the whole Regulated Distribution System regardless of the voltage level at which the End-user is served or the capacity of a connection.
- Interruptions arising from Excluded Events are not to be taken into account in calculating the SAIFI.

### *A2.2 CAIDI*

Definition of index : Customer average interruption duration index

Description : The average time required per Sustained Interruption to restore service to the an End-user (measured in minutes).

Calculation : The CAIDI is calculated with the following formula :

$$CAIDI = \frac{\sum (r_i N_i)}{\sum N_i}$$

where,

$N_i$ = Number of End-users experiencing Sustained Interruptions caused as a result of a single event *i.*

$\sum N_i$ = Total number of Sustained Interruptions experienced by End-users within the Measurement Period.

$r_i$ = Duration of a Sustained Interruption (in minutes) caused as a result of an event *i*.

$\sum (r_i N_i)$ = Total customer-minutes of Sustained Interruptions experienced over the Measurement Period.

Comments : i. The CAIDI calculation includes Planned and Unplanned Interruptions.

ii. Only Sustained Interruptions are considered.

iii. CAIDI is to be calculated across the full End-user base affected by interruptions, for the whole Regulated Distribution System, regardless of the voltage level at which the End-user is served or the capacity of the connection.

iv. Interruptions arising from Excluded Events are not to be taken into account in calculating the CAIDI.

### *A2.3 Planned SAIDI*

Definition of index : System average interruption duration index (for Planned Interruptions)

Description : The average duration of Sustained Interruptions per End-user over the Measurement Period, for Planned Interruptions (measured in minutes).

Calculation : The SAIDI is calculated with the following formula :

$$SAIDI = \frac{\sum(r_i N_i)}{N_T}$$

where,

$N_i$ = Number of End-users experiencing Sustained Interruptions caused as a result of a single planned event *i.*

$r_i$ = Duration of a Sustained Interruption (in minutes) caused as a result of a planned event *i*.

$\sum(r_i N_i)$ = Total customer-minutes of Sustained Interruptions experienced over the Measurement Period, arising from Planned Interruptions.

$N_T$ = Total number of End-users served in the Measurement Area (average over the Measurement Period).

Comments :

i. The planned SAIDI is to be calculated for Planned Interruptions only.

ii. Only Sustained Interruptions are considered.

iii. Planned SAIDI is to be calculated across the full End-user base, for the whole Regulated Distribution System, regardless of the voltage level at which the End-user is served or the capacity of the connection.

iv. Interruptions arising from Excluded Events are not to be taken into account in calculating the planned SAIDI.

### *A2.4 Voltage violations*

Description : The probability that the Long-duration Voltage at any Measurement point on the Distribution System falls between 90% and 110% of the nominal voltage level at that point, based on representative sample measurements taken over the Measurement Period.

Calculation : A voltage violation exists where the measured Long-duration Voltage ($V_m$) falls outside the following limits :

$$V_m \geq 1.1V_n$$

or

$$V_m \leq 0.9V_n$$

where,

$V_m$ = The Long-duration Voltage measured at a Measurement Point

$V_n$ = The nominal (RMS) voltage level at the Measurement Point

The probability of a voltage violation occurring on the Distribution System is calculated as follows :

$$pV_v = \frac{Number\ of\ voltage\ violations\ encountered}{Number\ of\ long\ duration\ voltage\ readings\ taken}$$

where,

$pV_v$ = Probability of a voltage violation occurring over the Measurement Period

Comments : i. The Long-duration Voltage measurements must be taken in sufficient quantity, at representative Measurement Points across the full Distribution System and at various times of the load cycle to provide a true representation of voltage violations on the Distribution System.

ii. Details of the Long-duration Voltage measurement program must be presented for the approval to the ERC prior to implementation of the performance incentive scheme.

### *A2.5 System losses*

Description : Technical and non-technical losses occurring on a Distribution System during the conveyance of electricity to End-users.

Calculation : The losses are calculated as follows :

$$SL = \frac{(UI_t - UD_t) \times 100}{UI_t} \text{ - } 1\%$$

where, [7]

[7] The 1% allowance is for administrative losses, covering energy required for the proper operation of the Distribution System (which includes consumption by essential loads at distribution substations, offices of the distribution utilities, warehouses and workshops of the distribution utilities and other essential loads of the utilities). This is in accordance with the maximum figure allowed under Rule IX of the Rules and Regulations Implementing Act (Republic Act no 7832).

SL = Total technical and non-technical system losses (measured in %) over the Measurement Period

$UI_t$ = The total MWh[8] energy delivered to a Distribution System over the Measurement Period, measured as the sum of all the energy delivered to the Distribution System over that Measurement Period, at each Grid Connection Point and connection point to an embedded generator

$UD_t$ = The total invoiced energy delivered (in MWh) to End Users connected to a Distribution System over the Measurement Period.[9]

Comments : i. All generation connection points where energy is delivered into the Distribution System should be taken into account.

ii. These generation connection points are to be described to the ERC and the ERC has to be notified of any changes in or additions to connection points.

### *A2.6 Time to process applications for Regulated Distribution Services*

Description : The average time between receiving an application for a Regulated Distribution Service (including, for the purpose of this measure, applications for Distribution Connection Services), processing and approving the application.

Calculation : The average time to process applications will be calculated as follows :

$$TA = \frac{\sum (DatN_i - DL_i - DatA_i)}{AplCom}$$

where,

TA = The average time to process an application (in days). This is calculated for applications for which the processing was completed during the Measurement Period.

$DatA_i$ = Date when an application *i* for a Regulated Distribution Service is received, converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

$DatN_i$ = Date when the customer is notified that the Regulated Distribution Service *i* has been approved (or finally disapproved), converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

[8] Where more appropriate GWh can be used as the measurement unit for this index

[9] Note that this figure includes those units delivered to end users that are not paid for, resulting in bad debts.

$DL_i$ = Time lost in processing application *i* due to factors outside the control of the Regulated Entity (measured in days). Any such event lasting less than 12 hours shall be counted as one half-day (0.5 days).

AplCom = Number of approved applications for which processing was completed over the measurement period.

Comments :

i. Calendar days are considered for the calculations.

ii. Completed processing means the point at which an applicant is notified that its application for a Regulated Distribution System has been approved and the terms for this approval are notified.

iii. Time lost due to factors outside the control of Regulated Entities will be limited to the following :

- time to obtain licenses, permissions or approvals from parties external to Regulated Entities, from the date that such applications are lodged to when the required response is obtained;[10] and
- time awaiting further information from an applicant, without which such applications cannot proceed, from the Notification Date for a request for information until the Response Date, when an answer or commitment is received that allows processing of the application to proceed.

### *A2.7 Time to connect premises to the Regulated Distribution System*

Description : The average time for providing a connection to a Regulated Distribution Service after all government (local and national) approvals have been obtained and the Regulated Entity requirements have been met by the applicant for the service.

Calculation : The average time to provide applications will be calculated as follows :

$$TC = \frac{\sum (DatC_i - DL_i - DatR_i)}{ConCom}$$

where,

TC = The average time to complete a connection to the Regulated Distribution System (in calendar days). This is calculated for connections completed during the Measurement Period.

$DatC_i$ = Date when a connection *i* was completed, converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

[10] Which could include the final rejection of the application, resulting in the inability of the Regulated Entity to provide the required service.

$DatR_i$ = Date when the connection *i* was ready to commence after receiving all necessary approvals and the applicant has met all requirements for the connection to proceed, converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

$DL_i$ = Time lost in providing connection *i* due to factors outside the control of the Regulated Entity (measured in days). Any such event lasting less than 12 hours shall be counted as one half-day (0.5 days).

ConCom = Number of connections completed over the measurement period.

Comments : i. Calendar days are considered.

ii. Completed connection mean the date at which the applicant is notified that it can start consuming electricity through the connection point, after all testing and commissioning work and the necessary certification have been completed.

iii. Time lost due to factors outside the control of Regulated Entities will be limited to the following :

- time that access to the connection site is not possible due to actions or non-actions by the connection applicant or where severe weather conditions, natural or manmade disasters prevent access to the site; and
- time awaiting further information from an applicant after it has been notified of a problem that hinders construction of the connection point, from the Notification Date until the Response Date when an answer or commitment is received that allows the installation of the connection to proceed.

### *A2.8 Performance of call-centre – percentage of calls answered within required time*

Description : The average time (in seconds) for answering a call placed to a Regulated Entity's call-center (or equivalent service provider, if a formal call-center does not exist).

Calculation : The average time to answer calls, from the time a call is logged, till such time that a substantive response is provided.

Comments : i. Only substantive responses are considered to be an answer to a call. In particular, placing calls on hold, or providing an automated response that does not directly result in the query being addressed, are not classed as substantive responses.

ii. If a call-center is not operating for any period of time, this implies that all calls made to the center during this time exceeded the penalty threshold. For such periods, Regulated Entities must provide an estimate of the number of calls that would have been missed, based

on historical calling trends. Details of such events, and the supporting evidence for the Regulated Entity's forecast, must be submitted to the ERC with the quarterly performance submission.

## A3. Guaranteed Service Level incentive scheme

### *A3.1 GSL1 : Duration of sustained interruptions above annual threshold level*

Description : The total duration of the Sustained Interruptions experienced by an End-user over the Measurement Period.

Calculation : The sum of the duration of all the Sustained Interruptions experienced by an End-user at a single Connection Point over the Measurement Period.

Comments :

i. Planned and Unplanned Interruptions are the be included.

ii. The calculation only applies to a single End-user – if the End-user should terminate its connection during the course of a Measurement Period, a new cumulative total will be started for the next End-user at the same connection point. The original End-user will also not be allowed to continue with its earlier cumulative total at its next Connection Point.

iii. Regulated Entities are obliged to maintain the cumulative total and advise an End-user if the threshold has been exceeded and it is entitled to a penalty payment.

### *A3.2 GSL2 : Number of Sustained Interruptions above annual threshold level*

Description : The total number of Sustained Interruptions experienced by an End-user over the Measurement Period.

Calculation : The number of Sustained Interruptions experienced by an End-user at a single Connection Point over the Measurement Period.

Comments :

i. Interruptions include planned and unplanned outages.

ii. The calculation only applies to a single End-user – if the End-user should terminate its connection during the course of a Measurement Period, a new cumulative total will be started for the next End-user at the same connection point. The original End-user will also not be allowed to continue with its earlier cumulative total at its next Connection Point.

iii. Regulated Entities are obliged to maintain the cumulative total and advise an End-user if the threshold has been exceeded and it is entitled to a penalty payment.

### *A3.3 GSL3 : Restoration of supply after fault on Secondary Side of Distribution System*

Description : The duration of an Interruption to an End-user resulting from a fault on the Secondary Side of the Regulated Distribution System, including on the Distribution Connection Assets.

Calculation : The period between the occurrence of a fault on the Secondary Side of the Distribution System, or the time at which such a fault is reported to a Regulated Entity, and the time at which the fault has been repaired and service to the affected End-user restored.

Comments :
i. Planned Interruptions are not included.
ii. Where more than one End-user is affected by the same fault, and the time to restore exceeds the threshold, penalties will be payable to all End-users affected.
iii. Temporary restoration of supply, defined as restoration for less than two hours, does not constitute restoration in terms of this index and the calculation period will extend from the original occurrence of the fault (or the time it was reported), till such time that the supply is fully restored (with fully restored defined as available at normal supply capacity for an uninterrupted period longer than two hours).

### *A3.4 GSL4 : Failure to provide a connection on time*

Description : A Regulated Entity fails to provide a connection to the Regulated Distribution System on the day previously agreed with a customer.

Calculation : The number of days (or parts of days) between the date at which a connection to the Regulated Distribution System is provided and the day agreed with a customer for the connection, if the date agreed is earlier than the date on which on which the connection is provided. The penalty will increase with the penalty amount for each day that the connection is late, up to a maximum of five days.

Comments :
i. The agreed connection day should be in writing, or in verifiable electronic form.
ii. Changes to the originally agreed connection day made with the mutual, prior approval of the Customer and the Regulated Entity will result in a new connection date. In this case, penalties will only be calculated from the new connection date forward.

## A4. Information disclosure

Network performance indices

### *A4.1 MAIFI*

Definition of index : Momentary average interruption frequency index

Description : The average frequency of momentary interruptions over the Measurement Period.

Calculation : The MAIFI is calculated with the following formula :

$$MAIFI = \frac{\sum N_{mi}}{N_T}$$

where,

$N_{mi}$ = Number of End-users experiencing Momentary Interruptions as a result of Momentary Interruption event *i.*

$N_T$ = Total number of End-users served in the Measurement Area (average over the Measurement Period).

Comments : i. The MAIFI is to be calculated across the full End-user base, for the whole Regulated Distribution System, regardless of the voltage level at which the End-user is served or the capacity of the connection.

ii. Interruptions arising from Excluded Events are not to be taken into account in calculating the planned SAIDI.

### *A4.2 Frequency of Tripping Events per 100 circuit-km*

Description : The frequency of Tripping Events experienced on subtransmission and distribution circuits forming part of the Primary Side of the Distribution Network per 100 km of circuit length making up the circuits forming part of the Primary Side of the Distribution Network.

Calculation : Frequency of tripping events per 100 circuit-km:

$$FTI = \frac{Number\ of\ tripping\ events\ over\ Measurement\ Period}{(\frac{CK}{100})}$$

where,

$FTI$ = Frequency of tripping events per 100 circuit-km

$CK$ = Length of circuits in the Primary Side of the Distribution Network (distribution and subtransmission circuits) measured in kilometer

Comments : i. The index is to be calculated for the whole Regulated Distribution System.

ii. Only Tripping Events associated with components of the Regulated Distribution System are to be considered.

### *A4.3 Average time to respond to queries and complaints*

Description : The average time between receiving a substantive query or complaint and responding to it in a substantive manner.

Calculation : The average time will be calculated as follows :

$$AQT = \frac{\sum (DatR_i - DL_i - DatQ_i)}{QueNum}$$

where,

$AQT$ = The average time to respond to queries and complaints

$DatR_i$ = Date when a substantive response is provided to a query or complaint ($i$), converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

$DatQ_i$ = Date when a substantive query or complaint ($i$) is received by a Regulated Entity, converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

$DL_i$ = Time lost in processing query or complaint ($i$) due to factors outside the control of the Regulated Entity (measured in days). Any such event lasting less than 12 hours shall be counted as one half-day (0.5 days).

$QueNum$ = Number of queries or complaints received over the Measurement Period.

Comments : i. Calendar days are considered for the calculations.

a. Substantive reaction is considered to be a reaction that either fully addresses a query or complaint, or sets in motion a chain of actions that will address the issue on which a complaint was laid. Merely acknowledging receipt of a query or complaint is not considered substantive reaction.

b. Casual or facetious queries or complaints are not considered substantive and should be excluded from this measure. Queries or complaints made purely for vindictive or malignant reasons are likewise to be excluded.

iv. Time lost due to factors outside the control of Regulated Entities will be limited to the following :

- time to obtain information from third parties, not being employees or contractors of the Regulated Entity after requests for such information has been passed on; and
- time awaiting further information from an applicant, without which further processing of the query or complaint cannot proceed, from the Notification Date for a request for further

information until the Response Date, when the information is received that allows the query or complaint to be addressed.

### *A4.4 Average time to reconnect a service after payment of all dues*

Description : The average time to reconnect a service that had been disconnected before due to non-payment of dues, after all such dues have been fully settled.

Calculation : The average time will be calculated as follows :

$$ARS = \frac{\sum (DatS_i - DL_i - DatD_i)}{SerRc}$$

where,

$ARS$ = The average time to reconnect a service after all dues have been settled

$DatS_i$ = Date when a service $i$ is fully restored after all dues have been settled, converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

$DatD_i$ = Date when full settlement of all outstanding dues in relation to service $i$ is made, converted to a numerical index that allows the calculation of calendar days elapsed between this date and another.

$DL_i$ = Time lost in restoring service $i$ due to factors outside the control of the Regulated Entity (measured in days). Any such event lasting less than 12 hours shall be counted as one half-day (0.5 days).

$SerRc$ = Number of services reconnected over the Measurement Period, after settlement of dues for these services.

Comments : i. Calendar days are considered for the calculations.

ii. Time lost due to factors outside the control of Regulated Entities will be limited to the following :

- time that access to the connection site is not possible due to actions or non-actions by the connection applicant or where severe weather conditions, natural or manmade disasters prevent access to the site; and
- time awaiting further information from an applicant after it has been notified of a problem that hinders reconnection of the service, from the Notification Date until the Response Date when an answer or commitment is received that allows the installation of the connection to proceed.

# APPENDIX B: TEMPLATE FOR SERVICE PERFORMANCE MEASUREMENT

For the purposes of the performance incentive scheme required in terms of clause 4.18.1 of the DWRG and as expanded in above, the following service performance templates are to be completed for each Regulated Distribution System.

Sheet 1 contains the template for historical performance information to be submitted and sheet 2 for the ongoing monthly performance information. The following should be noted:

- Information must be provided separately for each Regulated Distribution System.
- Where information cannot be supplied, this should be indicated and the reason for this provided.
- All information submissions have to be certified by the CEO (or equivalent) and the responsible Member of the Board (or equivalent) of the Regulated Entity.
- For the ongoing monthly submissions, the cumulative total or cumulative average for that Regulatory Year (up to the end of the month for which information is submitted) also has to be provided. The cumulative total at the end of June will be the annual total for a Regulatory Year.
- The template in sheet 2 should also be used for the provision of monthly performance information for the period between July 1, 2006 and June 30, 2007.

**SHEET 1 : HISTORICAL PERFORMANCE DATA**

| Performance index | Units | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| System average interruption frequency index (SAIFI) | Number | | | | | | | | | | |
| Customer average interruption duration index (CAIDI) | Minutes | | | | | | | | | | |
| Planned system average interruption duration index (SAIDI) | Minutes | | | | | | | | | | |
| Probability of voltage levels falling within prescribed limits | % | | | | | | | | | | |
| System losses | % | | | | | | | | | | |
| Average time to process applications for Regulated Distribution Services | Days | | | | | | | | | | |
| Average time to connect premises to the Regulated Distribution System | Days | | | | | | | | | | |
| Average time to answer calls at call centre | Seconds | | | | | | | | | | |
| Number of customers experiencing service interruptions longer than 10 hours | Number | | | | | | | | | | |
| Number of customers experiencing service interruptions longer than 15 hours | Number | | | | | | | | | | |
| Number of customers experiencing service interruptions longer than 20 hours | Number | | | | | | | | | | |
| Number of customers experiencing more than 10 sustained interruptions per year | Number | | | | | | | | | | |
| Number of customers experiencing more than 15 sustained interruptions per year | Number | | | | | | | | | | |
| Number of customers experiencing more than 20 sustained interruptions per year | Number | | | | | | | | | | |
| Number of customers for whom restoration of faults on the secondary distribution network were not restored within 12 hours | Number | | | | | | | | | | |
| Number of connections not delivered on days agreed with customers | Number | | | | | | | | | | |
| Number of connections delivered 2 days late | Number | | | | | | | | | | |
| Number of connections delivered 3 days late | Number | | | | | | | | | | |
| Number of connections delivered 4 day late | Number | | | | | | | | | | |
| Number of connections delivered 5 or more days late | Number | | | | | | | | | | |
| Momentary average interruption frequency index (MAIFI) | Number | | | | | | | | | | |
| Frequency of tripping events per 100 circuit-km | Number | | | | | | | | | | |
| Average time to respond to queries and complaints | Days | | | | | | | | | | |
| Average time to reconnect a service after payment of all dues | Days | | | | | | | | | | |

| Performance index | Units | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Cumulative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System average interruption frequency index (SAIFI) | Number | | | | | | | | | | | | | |
| Customer average interruption duration index (CAIDI) | Minutes | | | | | | | | | | | | | |
| Planned system average interruption duration index (SAIDI) | Minutes | | | | | | | | | | | | | |
| Probability of voltage levels falling within prescribed limits | % | | | | | | | | | | | | | |
| System losses | % | | | | | | | | | | | | | |
| Average time to process applications for Regulated Distribution Services | Days | | | | | | | | | | | | | |
| Average time to connect premises to the Regulated Distribution System | Days | | | | | | | | | | | | | |
| Average time to answer calls at call centre | Seconds | | | | | | | | | | | | | |
| Number of customers experiencing service interruptions longer than [GSL1 target] | Number | | | | | | | | | | | | | |
| Number of customers experiencing more than [GSL2 target] sustained interruptions per year | Number | | | | | | | | | | | | | |
| Number of customers for whom restoration of faults on the secondary distribution network were not restored within 12 hours | Number | | | | | | | | | | | | | |
| Number of connections not delivered on days agreed with customers | Number | | | | | | | | | | | | | |
| Number of connections delivered 2 days late | Number | | | | | | | | | | | | | |
| Number of connections delivered 3 days late | Number | | | | | | | | | | | | | |
| Number of connections delivered 4 day late | Number | | | | | | | | | | | | | |
| Number of connections delivered 5 or more days late | Number | | | | | | | | | | | | | |
| Momentary average interruption frequency index (MAIFI) | Number | | | | | | | | | | | | | |
| Frequency of tripping events per 100 circuit-km | Number | | | | | | | | | | | | | |
| Average time to respond to queries and complaints | Days | | | | | | | | | | | | | |
| Average time to reconnect a service after payment of all dues | Days | | | | | | | | | | | | | |