

Guidelines on the calculation and the use of loss factors for reconciliation purposes

Version 2.0

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Version control

Version	Date amended	Comments
1.0	15 June 2007	Draft for consultation.
2.0	12 June 2008	Draft for Board approval.
2.0	18 September 2008	Board approved. Updated with Commission style. Note: these guidelines will be reviewed by the Loss Factor Review Panel in early 2009.

Overview

1. These guidelines have been produced to promote understanding and encourage consistency in the calculation methodologies and processes surrounding distribution loss factors.
2. The general approach set out in this information guide in no way reduces the requirement upon participants and comply with their obligations under the Electricity Governance Rules 2003 (Rules). These guidelines do not necessarily reflect the Electricity Commission's (Commission) views about the Rules.
3. Please note that these guidelines will be reviewed by the Loss Factor Review Panel in early 2009.

Glossary of abbreviations and terms

Board	Electricity Commission Board
Commission	Electricity Commission
Rules	Electricity Governance Rules 2003

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Introduction

1. As required under the Government Policy Statement on Electricity Governance, the Commission should, whenever possible, use its powers of persuasion and promotion, and provision of information to achieve its objectives rather than recommending regulations and rules.
2. These guidelines are therefore recommended for use by distributors when calculating and publishing distribution loss factors for the purposes of reconciliation.

Defined terms

3. The following defined terms are used in these guidelines:
 - (a) “**non-technical loss factor**” means, a **loss factor** that represents the difference between reconciliation **losses** and technical **losses**. These **losses** represent inaccuracies caused by measurement and data handling and include **metering** and reading errors, incorrect **meter installations**, theft, and unread **meters**. Identification and quantification of this component, facilitates investigation into these inaccuracies, and a subsequent reduction in the **loss factor**;
 - (b) “**technical loss factor**” means a **loss factor** that represents the **electricity** that is consumed during the delivery to **consumers’** installations. There are two main technical components to the **loss**:
 - (i) a fixed component that arises from the standing **losses** of the zone substation and distribution transformers; and
 - (ii) variable components arising from the heating effects of the resistance in the delivery conductors. The resistive **losses** are proportional to the square of the current and occur in the high voltage (HV) and low voltage (LV) network conductors, the zone substations and distribution transformers;Identification and quantification of these components, facilitates investigation into improvements that are available to these components, and a consequent reduction in the **loss factor**;
 - (c) “**reconciliation loss factor**” means a **loss factor** that represents the difference between the delivered **electricity** at one **point of connection** and the **electricity** required to be injected into any other **point of connection** in order to supply the delivered **electricity**. This **loss factor** is used in:

- (i) the reconciliation process by the **reconciliation manager** to allocate volumes of **electricity** at grid exit points to **participants** (both buyers and sellers from/to the **clearing manager**); and
 - (ii) the retail pricing process by **retailers** for **electricity** purchases and, in the case of **grid exit point (GXP)** charging **networks**, the calculation of **network** charges.
4. Bolded words within the text of these Guidelines refer to definitions in part A of the Rules.

Distributor loss factor obligations

5. **Distributors** should calculate and publish on their websites both technical and non-technical **losses** and **loss factors** for each **loss category code** that they have used in the **registry** each year.
6. Technical **loss factors** should be reviewed every five years (unless, within a five year period, there is a significant change in **network** configuration and/or load, in which case the review should be re-run). **Technical loss factors** must be reported each year to the Commission.
7. Non-technical **loss factors** should be reviewed every year (using a sliding window of two years' generation and consumption information), and reported each year to the Commission.
8. **Distributors** should submit to the Commission the technical and non-technical and reconciliation **loss factors** (the format for this is detailed further below), and the **loss factor** methodology used to determine **loss factors** for the next financial year, prior to 1 March of each year.
9. **Distributors** should satisfy the Commission that the levels of **losses** are consistent with those of a well-managed **network**.
10. If the Commission disagrees with the **loss factors** calculated, the Commission will refer the issue to the Loss Factor Review Panel (LFRP), which will provide advice to the Commission on the **distributor's** compliance with these guidelines. In the event that the Commission considers that the **loss factors** are not calculated in accordance with the guidelines, the **distributor** should re-calculate the **loss factors**.

Trader loss factor obligations

11. In order to enable **distributors** to accurately calculate **loss factors**, **traders** should provide the following to **distributors** by 31 July each year, for the 12 month period to 1 April of that year:
 - (a) Prior to 1 May 2008 – annual billing information, normalised, and summarised by **network supply point**; and
 - (b) After 1 May 2008 - annual summarised reconciliation manager submission information by network supply point and loss category code.

Creation and population of loss category codes on the registry

12. **Distributors** must create **loss category codes** and **loss factors** and populate these into the **registry** loss factor table¹.
13. The **registry** will publish reconciliation **loss factors** for each **loss category code**².
14. **Loss category codes** are used in the **installation control point (ICP)** records on the **registry**³ to indicate to **traders**, and the **reconciliation manager** which **loss factors** apply for settlement purposes. **Retailers** may also use this code for the allocation of retail tariffs.
15. **Loss category codes** need to be unique, and the numbering system employed by **distributors** should ensure that these codes are unique. The number of characters must not exceed that allowed by the **registry**.
16. **Loss category codes** on the **registry** may comprise a maximum of two **loss factors** per calendar month, per flow direction⁴.
17. Backdated changes to **loss category codes** and **loss factors** alter reconciliation and invoicing history. Specific Rule requirements exist for forward notice that must be given for any new or changes to **loss category codes** and **loss factors**.⁵

¹ Rule 5 of schedule E1 of part E

² Rule 5.5 of schedule E1 of part E

³ Rule 2.6 of schedule E1 of part E

⁴ Rule 5.2 of schedule E1 of part E

Distributor loss factor methodology obligations

18. **Distributors** should submit to the Commission the technical, non technical and reconciliation **loss factors** calculated (format noted below) and the **loss factor** methodology used to determine **loss factors** for the next financial year prior to 1 March of each year.
19. The **loss factor** methodology applied by **distributors** in accordance with paragraph 8 should meet the following criteria:
- (a) Site-specific **loss factors** will be determined for a **point of connection**:
 - (i) for an embedded **generating unit** with a name plate rating of 10MW or more;
 - (ii) for an **customer** with actual or forecast **electricity** consumption of more than 40GWh or an electrical demand of more than 10 MW;
 - (iii) for a market **network** service provider; and
 - (iv) for the interconnection point between two or more **distributors networks**.

Site-specific **loss factors** may be calculated for **generating plant** or **consumer points of connection** at levels lower than the above at the discretion of the **distributor**.
 - (b) Different **loss factors** should be calculated for different voltage levels (as the **distributor** deems appropriate).
 - (c) **Distributors** should conduct load flow studies to assist in determining technical **loss factors**.
 - (d) The average used to determine reconciliation **loss factors** should be two years.
 - (e) The total amount of **electricity** calculated in relation to a **distributors network** (as adjusted for **losses** by the relevant **loss factor**) for a particular financial year will be as close as reasonably practicable to the total **metered** or estimated **electricity** flowing through all **points of connections** in the **distributors network** and the total (actual) **electricity losses** incurred on the **distributors network** in the financial year.
 - (f) **Distributors** should demonstrate the extent to which the objective above has been achieved through a reconciliation based on the previous financial year's

⁵ Rule 5.3 of schedule E1 of part E

adjusted gross **electricity** and **loss factors**, i.e. by a reconciliation between the aggregate adjusted gross **electricity** at all customer **points of connection** on the **distributors network** in the previous financial year (applying the **loss factors** set for that previous year) and the sum of the total metered **electricity** at those points in that year plus the total (actual) **losses** incurred on that **network** in that year.

- (g) For non-site-specific **points of connection**, the **loss factor** is to be determined by using a volume weighted average of the average **electricity loss** between the parent **network point of connection** to which it is assigned, and the relevant class of distribution **network points of connection** for the financial year in which the **loss factor** is to apply.
- (h) For site-specific **points of connection**, the **loss factor** should be determined by reference to the average **electricity loss** between the **distributors network point of connection** and the transmission **network point of connection** to which it is assigned in the financial year in which the **loss factor** is to apply.
- (i) **Distributors** should use the most recent actual load and generation data available for a consecutive 24-month period to determine the average **electricity losses** referred to above, adjusted where necessary to take into account projected load and or generation growth for the year in which the distribution **loss factors** are to apply.

Derivation of losses

20. **Losses** and **loss factors** should be derived as follows for each **network** area:

- (a) Gross **electricity** (Gr) flow should be determined using the immediate past 24 months **embedded generator** and customer **point of connection** injection and consumption information for an electrically connected **network** area.
- (b) Technical **losses** (TL) – this should be determined for an electrically connected **network** area by load flow studies as determined above, allocated to each **loss category code**.
- (c) Reconciliation **losses** (RL) – this should be derived from the immediate past 24 months injection and consumption information for an electrically connected **network** area, allocated to each **loss category code**.
- (d) Non Technical **Losses** (NTL) – this should be derived using the equation

$$\text{NTL} = \text{RL} - \text{TL}$$

- (e) Technical **loss factor** (TLF) – this should be derived using the equation

$$\text{TLF} = 1 + (\text{TL}/\text{Gr})$$

- (f) Reconciliation **loss factor** (RLF) – this should be derived using the equation

$$\text{RLF} = 1 + (\text{RL}/\text{Gr})$$

- (g) Non technical **loss factor** (NTLF) – this should be derived using the equation

$$\text{NTLF} = 1 + (\text{NTL}/\text{Gr})$$

Loss Factor Review Panel

21. A technical panel called the Loss Factor Review Panel will be established by the Commission to provide advice to the Commission on any issues that may arise with **loss factors** and **loss factor** methodologies used by **distributors**.
22. The Loss Factor Review Panel will be made up of an independent chair and two independent members with expert knowledge of the determination of **losses** and a Commission representative.
23. The Loss Factor Review Panel will report to the Commission.

Distributor loss factor report

24. **Distributors** should submit to the Commission their proposed **loss factors** for the next financial year prior to 1 March of each year regardless of whether or not there is any change from the previous financial year. The following information must form part of a **distributor's** submission:
- (a) a declaration that the proposed **loss factors** have been calculated based on the Commission's **loss factor** calculation guideline;
 - (b) the proposed site-specific **loss factors** for large **customers** and **embedded generators** requiring site-specific **loss factors**;
 - (c) the **network** average **loss factors** for all other **customers** and **embedded generators**;
 - (d) a statement of the reconciliation result in terms of over/under allocation of **losses** from the application of **loss factors** for the previous financial year; and
 - (e) a statement of the overall **losses** of the **distributor's network**.

25. The **distributor's** report must be in the CSV format specified below:

Distributor four letter code assigned by the Market Administrator	GXP losses factors applicable to	Loss category code used in the registry	Technical loss factor (TLF)	Year in which technical loss factor last calculated	Non technical loss factor calculated (NTLF)	Reconciliation loss factor (RF) calculated each year using a sliding two year window of generation and consumption	Description of customer group that loss category code is applicable to

Sources of information

26. The Rules can be found on the Commission's website at:
<http://www.electricitycommission.govt.nz/govern/regs/index.html>
27. If you require further assistance, please send an email to
retailoperations@electricitycommission.govt.nz