

1 April 2014



Mr Paul Dunn  
Director  
Australian Energy Regulator  
GPO Box 520  
Melbourne VIC 3011

Dear Mr Dunn

**Proposed alternative DLF methodology for the Southern and Central QGC Networks**

On 28 February 2012, the AER granted each of QGC, CNOOC Infrastructure Company Pty Limited, Tokyo Gas QCLNG Pty Limited and QGC (Infrastructure) Pty Limited (together, the **Joint Venturers**) an exemption from the requirement to register as a network service provider (**NPS**) for the Northern, Central and Southern QGC Networks under the National Electricity Rules (**NER**) (the **QGC Exemption**)

A condition of the exemption is that the Joint Venturers comply with the applicable clauses of NER relating to Distribution Loss Factors (**DLFs**). Under the NER, a site specific DLF must be calculated using the methodology published by the local distribution network service provider (DNSP), which in this case is Ergon. In the event this is unsuitable for the calculation, the exemption provides for the ability for the network operator and the connecting parties to jointly approach the Australian Energy Regulatory (**AER**) and seek an alternative DLF methodology for determining the allocation of electrical losses between the parties.

This letter advises that Ergon's methodology is not the preferred arrangement and QGC has the agreement of the connected parties to use an alternative calculation. We understand this meets our obligations of providing annual DLF's for the various regions on an annual basis. Attachment A contains copies of letters approving the proposed methodology for the relevant networks.

The relevant parties are:

- Australian Pacific LNG Pty Limited
- CNOOC Coal Seam Gas Company Pty Ltd
- Tokyo Gas QCLNG Pty Ltd
- Toyota Tsusho CBM Queensland Pty Ltd

Note a signed copy of the letter from Toyota Tsusho CBM Queensland Pty Ltd (**Toyota**) has not been provided, however, we are in communication with Toyota and expect the letter to be available shortly.

A copy of QGC's proposed DLF methodology can be made available on request and if there any further questions, please do not hesitate to contact me directly on (07) 3024 8999.

Yours sincerely,

A handwritten signature in black ink, which appears to read 'Erin Bledsoe', is written over the typed name.

Erin Bledsoe  
Regulatory Manager

13 March 2014



Jeremy Davies  
Joint Venture Manager  
Non-operated JVs  
Australia Pacific LNG Pty Limited  
Level 3  
135 Coronation Drive  
Milton, QLD 4064

Dear Mr. Davies,

**Proposed alternative DLF methodology for the Southern and Central QGC Networks**

The purpose of this letter is:

- to inform you of the Distribution Loss Factor (**DLF**) methodology QGC Pty Limited (**QGC**) proposes to use in calculating loss factors under the SESA for the Southern and Central QGC Networks (**Southern and Central Networks**), and
- to obtain your consent to the use of the proposed methodology as required by the relevant registration exemption issued by the Australian Energy Regulator (**AER**) for the Southern and Central Networks.

**BACKGROUND**

On 28 February 2012, the AER granted each of QGC, CNOOC Infrastructure Company Pty Limited, Tokyo Gas QCLNG Pty Limited and QGC (Infrastructure) Pty Limited (together, the **Joint Venturers**) an exemption from the requirement to register as a network service provider (**NSP**) for the Northern, Central and Southern QGC Networks under the National Electricity Rules (**NER**) (the **QGC Exemption**).

A condition of the QGC Exemption is that the Joint Venturers comply with the applicable clauses of the NER relating to DLFs. Under the NER, a site specific DLF must be calculated using the methodology published by the local distribution network service provider (**DNSP**), which in this case is Ergon.

However, the QGC Exemption provides that where Ergon's methodology is not suitable for the calculation of a site specific DLF, the network operator and the connecting parties may jointly approach the AER and seek approval of an alternative DLF methodology for determining the allocation of electrical losses between the parties.

QGC considers Ergon's methodology is not suitable and is proposing an alternative DLF methodology for approval by the AER. QGC requests that Australia Pacific LNG Pty Limited, in its capacity as a Joint Venture participant in the Southern and Central Networks, consents to the alternative DLF methodology, following which QGC will seek approval of the alternative methodology from the AER.

QGC Pty Limited  
Level 30, 275 George Street  
Brisbane QLD 4000  
GPO Box 3107  
Tel: +61 (0)7 3024 9000  
Fax: +61 (0)7 3024 8985  
www.qgc.com.au  
ABN 11 089 642 553

**PROPOSED ALTERNATIVE DLF METHODOLOGY**

A copy of QGC's proposed DLF methodology for the Southern and Central Networks is set out in Attachments 1 – 3. Attachment 1 sets out a high level description of the methodology which would be published on the AER's website for the purposes of obtaining approval. Attachments 2 and 3 set out a more detailed explanation of the Southern and Central Networks and the relevant formulae. It is not intended that Attachments 2 and 3 would be made public.

The key element of the proposed alternative DLF methodology is to use metering data from different points in the Southern and Central Network to determine dynamic loss factors rather than Ergon's DLF methodology which uses static or fixed loss factors.

There are a number of advantages with the alternative methodology. For example, as the networks are not yet energised and the load will be variable, it is difficult to determine the static loss factors which will likely require large true ups to reflect actual losses when determined. Further, the use of dynamic loss factors is more accurate and will eliminate the need for a true-up at the end of each financial year as a true-up occurs every 30 minutes instead and is billed monthly. The alternative DLF methodology will have no effect on National Electricity Market settlements and there will be no material impacts on any Joint Venturers in using the alternative mechanism.

**APPROVAL OF ALTERNATIVE DLF METHODOLOGY**

Please approve of QGC's proposed alternative DLF methodology for the Southern and Central Networks by countersigning the bottom of this letter and return to QGC Regulatory Manager, Erin Bledsoe.

When all Joint Venturers approve, QGC will approach the AER and seek approval of the alternative DLF methodology.

Should you have any questions regarding this letter or the attachments, please contact Erin Bledsoe on 07 3024 2621.

Yours sincerely



Bernard Carroll  
Lead Commercial Advisor

.....  
Signature

.....  
Signature

.....  
Name

.....  
Name

.....  
Position

.....  
Position

## Attachment 1 – Distribution loss factor methodology

The following sets out the methodologies for determining loss factors for each of the Southern and Central Networks which are the subject of the exemption from registration under the National Electricity Rules issued by the AER on 28 February 2012.

Each of the methodologies incorporates dynamic loss factors to give a determination of actual losses over each 30 minutes using metering data from relevant parts of each Network.

### Southern Network

The Southern Network comprises in broad terms:

- the Kumbarilla Park 275/132kV substation connects to the Ergon distribution network via 275kV feeders. There are Type 1 meters at the connection point on the Ergon network;
- a 132kV feeder from the Jordan 132kV/33kV substation to the Kumbarilla Park substation – there are meters at the Kumbarilla Park substation measuring the load feeding into that substation from the Jordan to Kumbarilla Park feeder. There are a number of loads connected to the Jordan substation, each of which is separately metered at the 33kV switchboards at the Jordan substation; and
- a 132kV feeder from the Ruby Jo substation to Kumbarilla Park substation - there are meters at the Kumbarilla Park substation measuring the load feeding into that substation from the Ruby Jo to Kumbarilla Park feeder. There are a number of loads connected to the Ruby Jo substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Ruby Jo substation.

It is necessary to determine loss factors for each set of these feeders.

The loss factors for the 132kV feeders are determined by dividing the load measured each half hour at the Kumbarilla Park substation for each feeder divided by the sum of the load measured at the 33kV switchboards in that half hour to give a dynamic half hourly loss factor based on actual measured losses.

The loss factor for the 275kV feeder between the Kumbarilla Park substation and the Ergon distribution network is determined by dividing the load measured at the connection point by the sum of the metered loads for the 132kV feeders at the Kumbarilla Park substation on a half hourly basis. This gives a dynamic half hourly loss factor on that feeder based on actual measured losses.

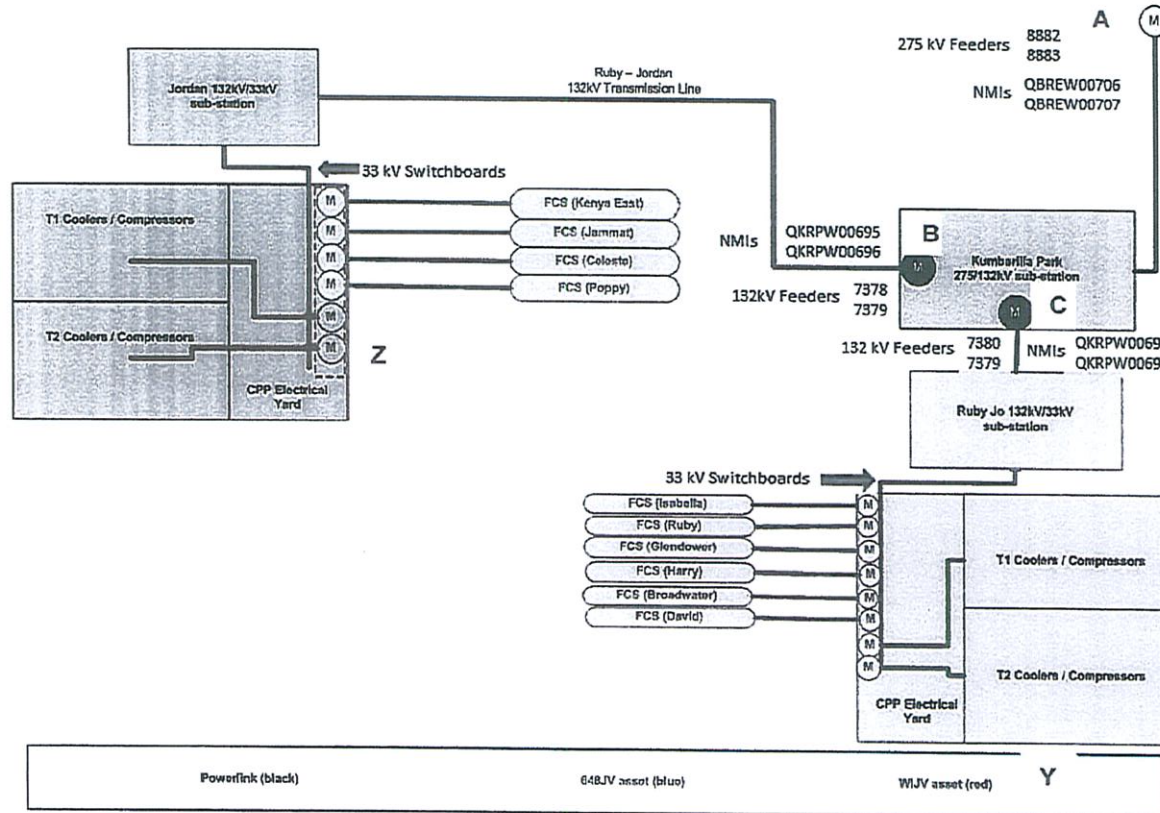
### Central Network

The Central Network broadly comprises two main sections for the purposes of determining loss factors.

The first section involves 132kV feeders connecting the Bellevue 132Kv/33kV substation and Condamine Power Station to the Columboola 275kV/132kV substation. The Columboola substation includes the connection points to the Ergon distribution network. For this section, QGC has determined a static loss factor of 1.001 based on engineering studies and actual experience of losses over this network based on historical metering data.

The second section involves a number of loads connected to the Bellevue 132Kv/33kV substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Bellevue substation. The loss factor for this section of the Central Network is determined by dividing the load measured at the meters at the Bellevue substation by the sum of the metered loads measured at the 33kV switchboards in that half hour to give a dynamic half hourly loss factor based on actual measured losses.

## Attachment 2 - Methodology for calculating the DLFs for the Southern Network



### Methodology

Each of meters A, B and C are Type 1 meters. All other meters on the diagram are Type 2 meters.

The loss factor applicable for the 8882 and 8883 275kV feeders is determined for each half hour using the following formula:

$$DLF = A / (B + C)$$

Where:

A = the average of the meters at the 275 kV feeders (8882 and 8883)

B = the average of the meters at the 132 kV feeders (7378 and 7379)

C = the average of meters at the 132 kV feeders (7379 and 7380)

The loss factor applicable to Ruby-Jordan 132kV transmission line is determined for each half hour using the following formula:

$$DLF = B / Z$$

Where:

B = as above

Z = Load measured by the meters at Z

The loss factor applicable to [the loads connecting to the Ruby Jo substation] is determined for each half hour using the following formula:

$$DLF = C / Y$$

Where:

C = as above

Y = Load measured by the meters at Y

### Formulae for determining loss factors

Dynamic Loss Factors (Calculated every 30 minutes):

$$DLF_{KP\_B} = (QBREW00706 + QBREW00707) / (QKRPW00695 + QKRPW00696 + QKRPW00697 + QKRPW00698)$$

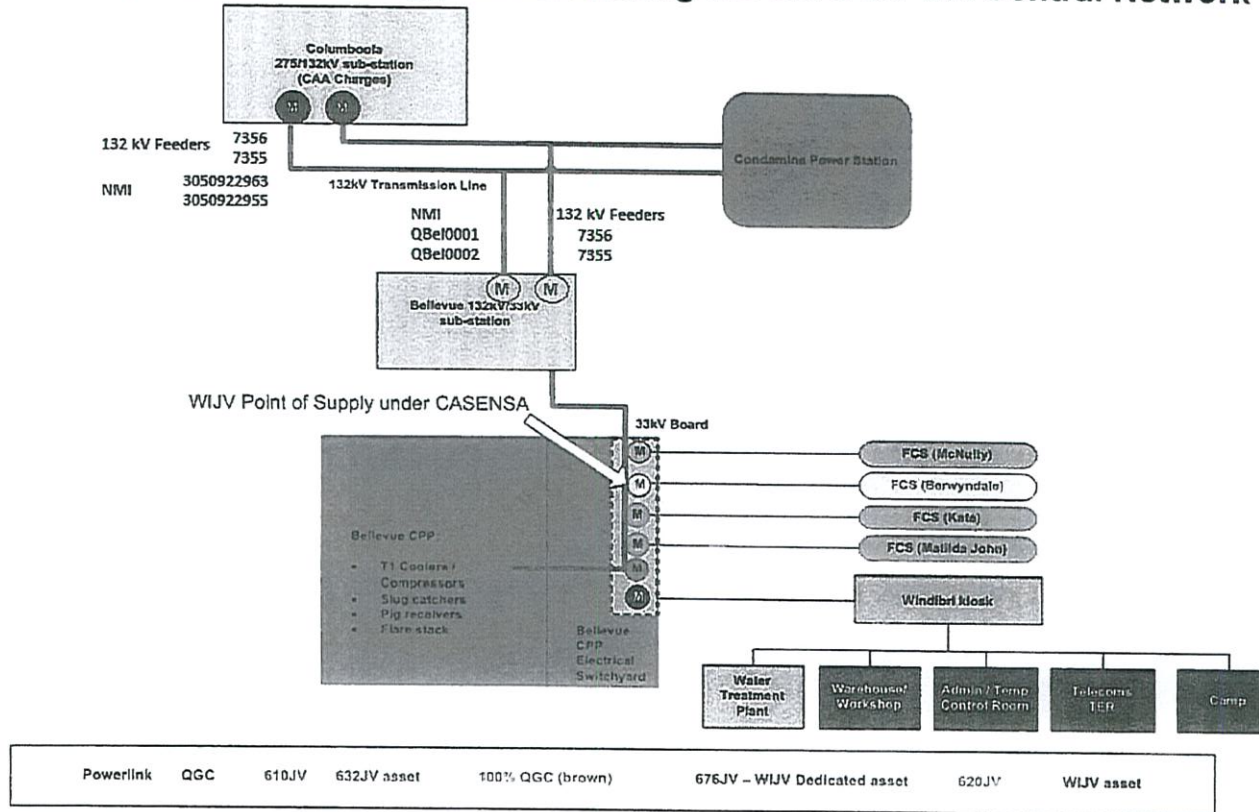
$$DLF_{R\_KP} = (QKRPW00697 + QKRPW00698) / \text{Sum } (i=1 \text{ to } 28) \text{ BC18001Hi}$$

$$DLF_{J\_KP} = (QKRPW00695 + QKRPW00696) / \text{Sum } (i=1 \text{ to } 28) \text{ BC14001Hi}$$

$$DLF_{J\_B} = DLF_{J\_KP} \times DLF_{KP\_B}$$

$$DLF_{R\_B} = DLF_{R\_KP} \times DLF_{KP\_B}$$

## Attachment 3 - Methodology for calculating the DLFs for the Central Network



### Methodology

The loss factor for the 132kV feeders (7355 and 7356) connecting the Condamine Power Station, Bellevue 132kV/33kV substation to the Columboola 275kV/132kV substation is a static loss factor, of 1.001. The static loss factor of 1.001 is based on engineering studies and the history of actual losses on these lines.

For the remainder of the Central Network which connects the loads to the Bellevue substation, a dynamic loss factor is determined for each half hour using the following formula:

DLF = Load at Bellevue / the sum of the loads of the meters at the 33kv switchboard.

### Formulae for determining loss factors

Virtual meter:

$$\text{CPS(Generation @ Columboola)} = (3050922963 + 3050922955) - 1.001 \times (\text{QBel0001} + \text{QBel 0002})$$

$$\text{Bellevue (Load @ Columboola)} = 1.001 \times (\text{QBel0001} + \text{QBel 0002})$$

Dynamic Loss Factors (Calculated every 30 minutes):

$$\text{DLF\_Bel33\_Bel132} = (\text{QBel0001} + \text{QBel 0002}) / \text{Sum (i=1 to 28) BC07001Hi}$$

$$\text{DLF\_Bel33\_Col} = 1.001 \times \text{DLF\_Bel33\_Bel132}$$

16 August 2013



Mr Wang Maoshan  
General Manager  
CNOOC Coal Seam Gas Company Pty Ltd  
Level 34 Riverside Centre  
123 Eagle Street  
BRISBANE QLD 4000

Dear Mr Maoshan

### **Proposed alternative DLF methodology for the QGC Networks for 2013 – 2014**

We have recently sent you a draft Shared Electricity Supply Agreement (**SESA**).

The purpose of this letter is:

- to inform you of the Distribution Loss Factor (**DLF**) methodology QGC Pty Limited (**QGC**) proposes to use in calculating loss factors under the SESA for the Southern, Central and Northern QGC Networks (**QGC Networks**), and
- to obtain your consent to the use of the proposed methodology as required by the relevant registration exemption issued by the Australian Energy Regulator (**AER**) for the QGC Networks.

### **BACKGROUND**

On 28 February 2012, the AER granted each of QGC, CNOOC Infrastructure Company Pty Limited, Tokyo Gas QCLNG Pty Limited and QGC (Infrastructure) Pty Limited (together, the **Joint Venturers**) an exemption from the requirement to register as a network service provider (**NSP**) for the QGC Networks under the National Electricity Rules (**NER**) (the **QGC Exemption**).

A condition of the QGC Exemption is that the Joint Venturers comply with the applicable clauses of the NER relating to DLFs. Under the NER, a site specific DLF must be calculated using the methodology published by the local distribution network service provider (**DNSP**), which in this case is Ergon.

However, the QGC Exemption provides that where Ergon's methodology is not suitable for the calculation of a site specific DLF, the network operator and the connecting parties may jointly approach the AER and seek approval of an alternative DLF methodology for determining the allocation of electrical losses between the parties.

QGC considers Ergon's methodology is not suitable and is proposing an alternative DLF methodology for approval by the AER. QGC requests that CNOOC Coal Seam Gas Company Pty Ltd, in its capacity as a Joint Venture participant, consents to the alternative DLF methodology, following which QGC will seek approval of the alternative methodology from the AER.

### **PROPOSED ALTERNATIVE DLF METHODOLOGY**

A copy of QGC's proposed DLF methodology for each of the QGC Networks is set out in Attachments 1 – 4. Attachment 1 sets out a high level description of the methodology which would be published on the AER's website for the purposes of obtaining approval. Attachments 2 – 4 set out a more detailed explanation of the methodology for each QGC Network and the relevant formulae. It is not intended that Attachments 2 - 4 would be made public.

The key element of the proposed alternative DLF methodology is to use metering data from different points in each Network to determine dynamic loss factors rather than Ergon's DLF methodology which uses static or fixed loss factors.

There are a number of advantages with the alternative methodology. For example, as the networks are not yet energised and the load will be variable, it is difficult to determine the static loss factors which will likely require large true ups to reflect actual losses when determined. Further, the use of dynamic loss factors is more accurate and will eliminate the need for a true-up at the end of each financial year as a true-up occurs every 30 minutes instead and is billed monthly. The alternative DLF methodology will have no effect on National Electricity Market settlements and there will be no material impacts on any Joint Venturers in using the alternative mechanism.

**APPROVAL OF ALTERNATIVE DLF METHODOLOGY**

Please approve of QGC's proposed alternative DLF methodology for the QGC Networks by countersigning the bottom of this letter and return to QGC Regulatory Manager, Roger Jones, by 23 August 2013.

When all Joint Venturers approve, QGC will approach the AER and seek approval of the alternative DLF methodology.

Should you have any questions regarding this letter or the attachments, please contact Roger Jones, QGC Regulatory Manager on 07 3024 7836.

Yours sincerely




Roger Jones  
QGC Regulatory Manager

.....  
Signature

.....  
Name

.....  
Position

  
.....  
Signature

WANG MAO SHAN  
.....  
Name

Director  
CNOOC Coal Seam Gas Company  
.....  
Position



## **Attachment 1 – Distribution loss factor methodology**

The following sets out the methodologies for determining loss factors for each of the QGC Networks which are the subject of the exemption from registration under the National Electricity Rules issued by the AER on 28 February 2012.

Each of the methodologies incorporates dynamic loss factors to give a determination of actual losses over each 30 minutes using metering data from relevant parts of each Network.

### **Southern Network**

The Southern Network comprises in broad terms:

- the Kumbarilla Park 275/132kV substation connects to the Ergon distribution network via 275kV feeders. There are Type 1 meters at the connection point on the Ergon network;
- a 132kV feeder from the Jordan 132kV/33kV substation to the Kumbarilla Park substation – there are meters at the Kumbarilla Park substation measuring the load feeding into that substation from the Jordan to Kumbarilla Park feeder. There are a number of loads connected to the Jordan substation, each of which is separately metered at the 33kV switchboards at the Jordan substation; and
- a 132kV feeder from the Ruby Jo substation to Kumbarilla Park substation - there are meters at the Kumbarilla Park substation measuring the load feeding into that substation from the Ruby Jo to Kumbarilla Park feeder. There are a number of loads connected to the Ruby Jo substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Ruby Jo substation.

It is necessary to determine loss factors for each set of these feeders.

The loss factors for the 132kV feeders are determined by dividing the load measured each half hour at the Kumbarilla Park substation for each feeder divided by the sum of the load measured at the 33kV switchboards in that half hour to give a dynamic half hourly loss factor based on actual measured losses.

The loss factor for the 275kV feeder between the Kumbarilla Park substation and the Ergon distribution network is determined by dividing the load measured at the connection point by the sum of the metered loads for the 132kV feeders at the Kumbarilla Park substation on a half hourly basis. This gives a dynamic half hourly loss factor on that feeder based on actual measured losses.

### **Central Network**

The Central Network broadly comprises two main sections for the purposes of determining loss factors.

The first section involves 132kV feeders connecting the Bellevue 132kV/33kV substation and Condamine Power Station to the Columboola 275kV/132kV substation. The Columboola substation includes the connection points to the Ergon distribution network. For this section, QGC has determined a static loss factor of 1.001 based on engineering studies and actual experience of losses over this network based on historical metering data.

The second section involves a number of loads connected to the Bellevue 132kV/33kV substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Bellevue substation. The loss factor for this section of the Central Network is determined by dividing the load measured at the meters at the Bellevue substation by the sum of the metered loads measured at the 33kV switchboards in that half hour to give a dynamic half hourly loss factor based on actual measured losses.

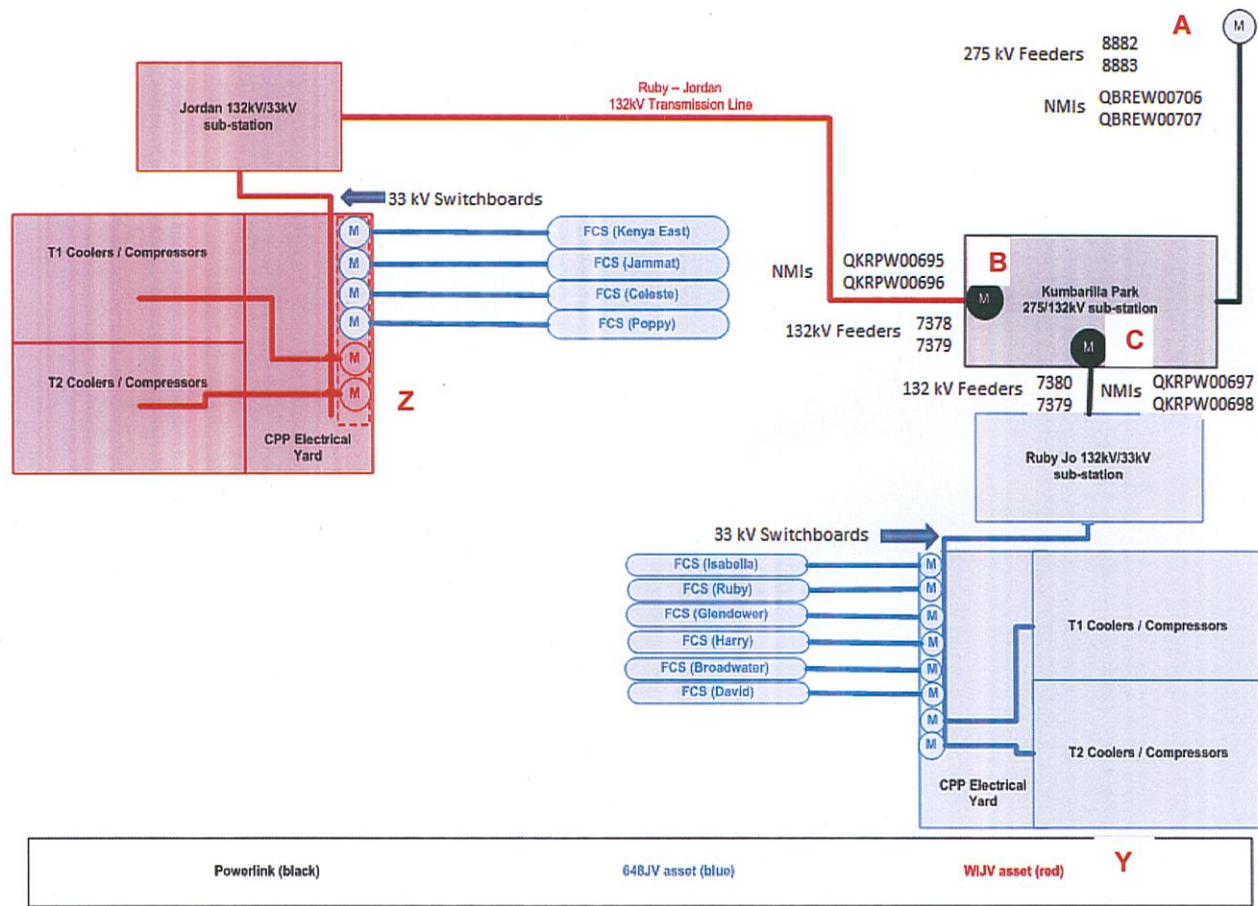
## Northern Network

The Northern Network broadly comprises:

- the Wandoan South 275/132kV substation at which the connection point to the Ergon distribution network is located;
- a 132kV feeder connecting the Wolleebee Creek 132kV/33kV substation to the Wandoan South 275/132kV substation; and
- a number of loads connected to the Wolleebee Creek substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Wolleebee Creek substation.

The loss factor for the Northern Network is determined by dividing the load measured at the connection point at the Wandoan South substation by the sum of the metered loads at the 33kV switchboard on a half hourly basis. This gives a dynamic half hourly loss factor on that feeder based on actual measured losses.

## Attachment 2 - Methodology for calculating the DLFs for the Southern Network



### Methodology

Each of meters A, B and C are Type 1 meters. All other meters on the diagram are Type 2 meters.

The loss factor applicable for the 8882 and 8883 275kV feeders is determined for each half hour using the following formula:

$$DLF = A / (B + C)$$

Where:

A = the average of the meters at the 275 kV feeders (8882 and 8883)

B = the average of the meters at the 132 kV feeders (7378 and 7379)

C = the average of meters at the 132 kV feeders (7379 and 7380)

The loss factor applicable to Ruby-Jordan 132KV transmission line is determined for each half hour using the following formula:

$$DLF = B / Z$$

Where:

B = as above

Z = Load measured by the meters at Z

The loss factor applicable to [the loads connecting to the Ruby Jo substation] is determined for each half hour using the following formula:

$$DLF = C / Y$$

Where:

C = as above

Y = Load measured by the meters at Y

### Formulae for determining loss factors

Dynamic Loss Factors (Calculated every 30 minutes):

$$DLF\_KP\_B = (QBREW00706 + QBREW00707) / (QKRPW00695 + QKRPW00696 + QKRPW00697 + QKRPW00698)$$

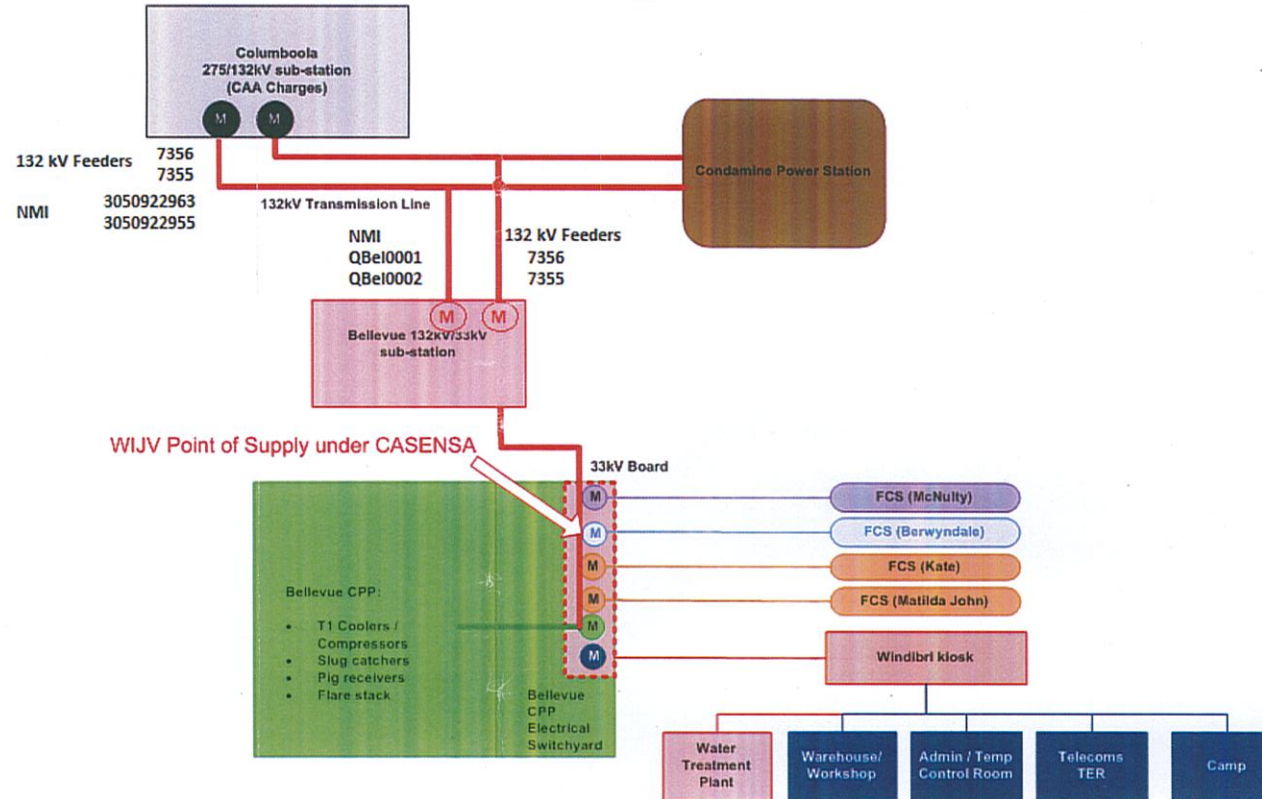
$$DLF\_R\_KP = (QKRPW00697 + QKRPW00698) / \text{Sum } (i=1 \text{ to } 28) \text{ BC18001Hi}$$

$$DLF\_J\_KP = (QKRPW00695 + QKRPW00696) / \text{Sum } (i=1 \text{ to } 28) \text{ BC14001Hi}$$

$$DLF\_J\_B = DLF\_J\_KP \times DLF\_KP\_B$$

$$DLF\_R\_B = DLF\_R\_KP \times DLF\_KP\_B$$

## Attachment 3 - Methodology for calculating the DLFs for the Central Network



### Methodology

The loss factor for the 132kV feeders (7355 and 7356) connecting the Condamine Power Station, Bellevue 132kV/33kV substation to the Columboola 275kV/132kV substation is a static loss factor, of 1.001. The static loss factor of 1.001 is based on engineering studies and the history of actual losses on these lines.

For the remainder of the Central Network which connects the loads to the Bellevue substation, a dynamic loss factor is determined for each half hour using the following formula:

$DLF = \text{Load at Bellevue} / \text{the sum of the loads of the meters at the 33kv switchboard.}$

Powerlink QGC 610JV 632JV asset 100% QGC (brown) 676JV – WIJV Dedicated asset 620JV WIJV asset

### Formulae for determining loss factors

Virtual meter:

$$CPS(\text{Generation @ Columboola}) = (3050922963 + 3050922955) - 1.001 \times (QBel0001 + QBel0002)$$

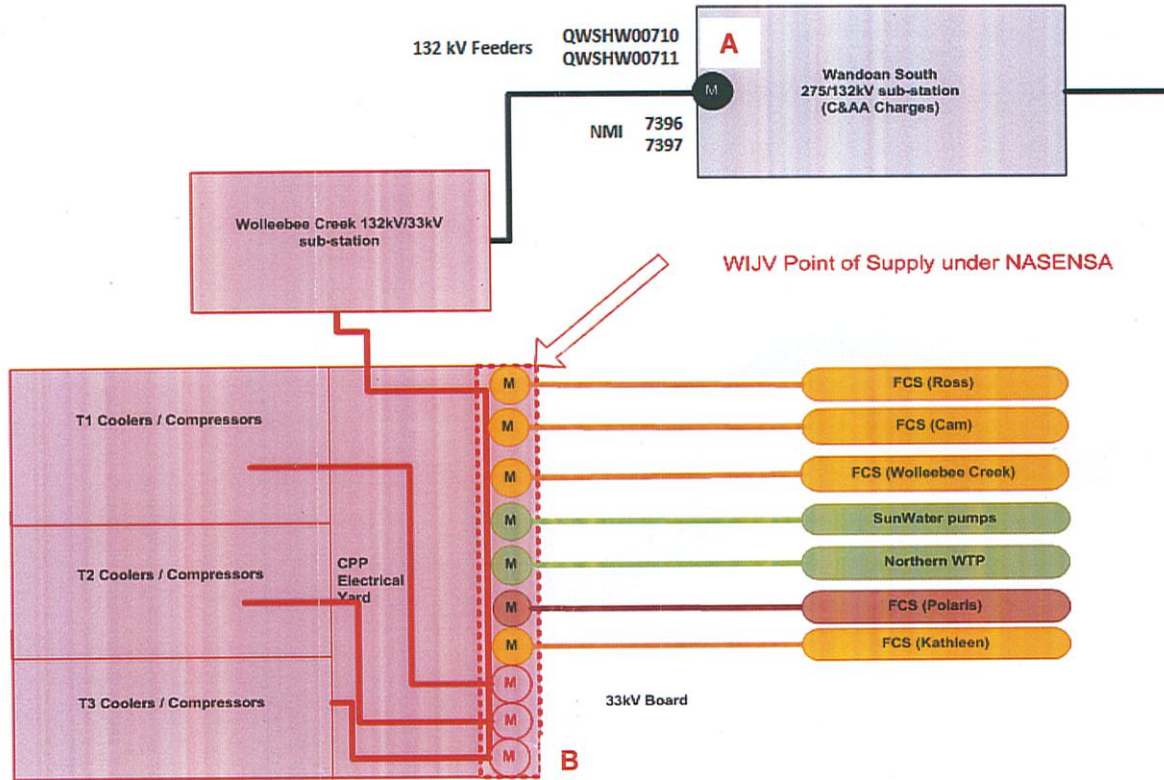
$$\text{Bellevue (Load @ Columboola)} = 1.001 \times (QBel0001 + QBel0002)$$

Dynamic Loss Factors (Calculated every 30 minutes):

$$DLF\_Bel33\_Bel132 = (QBel0001 + QBel0002) / \text{Sum (i=1 to 28) BC07001Hi}$$

$$DLF\_Bel33\_Col = 1.001 \times DLF\_Bel33\_Bel132$$

# Attachment 4 - Methodology for calculating the DLFs for the Northern Network



## Methodology

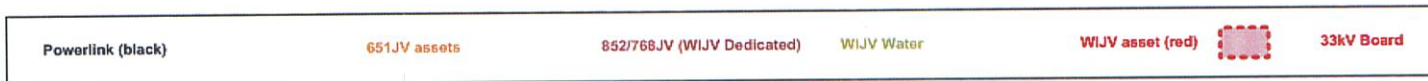
The loss factor applicable to the Northern Network is determined for each half hour using the following formula:

$$DLF = A / B$$

Where:

A = the average of the meters at the 132 kV feeders (710 and 711)

B = the sum of the loads of the meters at B



### Formulae for determining loss factors

Dynamic Loss Factors (Calculated every 30 minutes):

$$DLF\_Wck\_WoI = (QWSHW00710 + QWSHW00711) / \text{Sum } (i=1 \text{ to } 28) \text{ BC24001Hi}$$

16 August 2013



Ms Yumiko Yao  
Chief Executive Officer  
Tokyo Gas QCLNG Pty Ltd  
Level 21 Exchange Plaza  
2 The Esplanade  
PERTH WA 6000

Dear Ms Yao

### **Proposed alternative DLF methodology for the QGC Networks for 2013 – 2014**

We have recently sent you a draft Shared Electricity Supply Agreement (**SESA**).

The purpose of this letter is:

- to inform you of the Distribution Loss Factor (**DLF**) methodology QGC Pty Limited (**QGC**) proposes to use in calculating loss factors under the SESA for the Southern, Central and Northern QGC Networks (**QGC Networks**), and
- to obtain your consent to the use of the proposed methodology as required by the relevant registration exemption issued by the Australian Energy Regulator (**AER**) for the QGC Networks.

### **BACKGROUND**

On 28 February 2012, the AER granted each of QGC, CNOOC Infrastructure Company Pty Limited, Tokyo Gas QCLNG Pty Limited and QGC (Infrastructure) Pty Limited (together, the **Joint Venturers**) an exemption from the requirement to register as a network service provider (**NSP**) for the QGC Networks under the National Electricity Rules (**NER**) (the **QGC Exemption**).

A condition of the QGC Exemption is that the Joint Venturers comply with the applicable clauses of the NER relating to DLFs. Under the NER, a site specific DLF must be calculated using the methodology published by the local distribution network service provider (**DNSP**), which in this case is Ergon.

However, the QGC Exemption provides that where Ergon's methodology is not suitable for the calculation of a site specific DLF, the network operator and the connecting parties may jointly approach the AER and seek approval of an alternative DLF methodology for determining the allocation of electrical losses between the parties.

QGC considers Ergon's methodology is not suitable and is proposing an alternative DLF methodology for approval by the AER. QGC requests that Tokyo Gas QCLNG Pty Ltd, in its capacity as a Joint Venture participant, consents to the alternative DLF methodology, following which QGC will seek approval of the alternative methodology from the AER.

### **PROPOSED ALTERNATIVE DLF METHODOLOGY**

A copy of QGC's proposed DLF methodology for each of the QGC Networks is set out in Attachments 1 – 4. Attachment 1 sets out a high level description of the methodology which would be published on the AER's website for the purposes of obtaining approval. Attachments 2 – 4 set out a more detailed explanation of the methodology for each QGC Network and the relevant formulae. It is not intended that Attachments 2 - 4 would be made public.

The key element of the proposed alternative DLF methodology is to use metering data from different points in each Network to determine dynamic loss factors rather than Ergon's DLF methodology which uses static or fixed loss factors.

There are a number of advantages with the alternative methodology. For example, as the networks are not yet energised and the load will be variable, it is difficult to determine the static loss factors which will likely require large true ups to reflect actual losses when determined. Further, the use of dynamic loss factors is more accurate and will eliminate the need for a true-up at the end of each financial year as a true-up occurs every 30 minutes instead and is billed monthly. The alternative DLF methodology will have no effect on National Electricity Market settlements and there will be no material impacts on any Joint Venturers in using the alternative mechanism.

**APPROVAL OF ALTERNATIVE DLF METHODOLOGY**

Please approve of QGC's proposed alternative DLF methodology for the QGC Networks by countersigning the bottom of this letter and return to QGC Regulatory Manager, Roger Jones, by 23 August 2013.

When all Joint Venturers approve, QGC will approach the AER and seek approval of the alternative DLF methodology.

Should you have any questions regarding this letter or the attachments, please contact Roger Jones, QGC Regulatory Manager on 07 3024 7836.

Yours sincerely



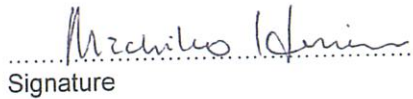
Roger Jones  
QGC Regulatory Manager

  
Signature

YUMIKO YAO

Name

CEO / Director  
Position

  
Signature

MICHIKO HIROSE

Name

Director  
Position

## Attachment 1 – Distribution loss factor methodology

The following sets out the methodologies for determining loss factors for each of the QGC Networks which are the subject of the exemption from registration under the National Electricity Rules issued by the AER on 28 February 2012.

Each of the methodologies incorporates dynamic loss factors to give a determination of actual losses over each 30 minutes using metering data from relevant parts of each Network.

### Southern Network

The Southern Network comprises in broad terms:

- the Kumbarilla Park 275/132kV substation connects to the Ergon distribution network via 275kV feeders. There are Type 1 meters at the connection point on the Ergon network;
- a 132kV feeder from the Jordan 132kV/33kV substation to the Kumbarilla Park substation – there are meters at the Kumbarilla Park substation measuring the load feeding into that substation from the Jordan to Kumbarilla Park feeder. There are a number of loads connected to the Jordan substation, each of which is separately metered at the 33kV switchboards at the Jordan substation; and
- a 132kV feeder from the Ruby Jo substation to Kumbarilla Park substation - there are meters at the Kumbarilla Park substation measuring the load feeding into that substation from the Ruby Jo to Kumbarilla Park feeder. There are a number of loads connected to the Ruby Jo substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Ruby Jo substation.

It is necessary to determine loss factors for each set of these feeders.

The loss factors for the 132kV feeders are determined by dividing the load measured each half hour at the Kumbarilla Park substation for each feeder divided by the sum of the load measured at the 33kV switchboards in that half hour to give a dynamic half hourly loss factor based on actual measured losses.

The loss factor for the 275kV feeder between the Kumbarilla Park substation and the Ergon distribution network is determined by dividing the load measured at the connection point by the sum of the metered loads for the 132kV feeders at the Kumbarilla Park substation on a half hourly basis. This gives a dynamic half hourly loss factor on that feeder based on actual measured losses.

### Central Network

The Central Network broadly comprises two main sections for the purposes of determining loss factors.

The first section involves 132kV feeders connecting the Bellevue 132kV/33kV substation and Condamine Power Station to the Columboola 275kV/132kV substation. The Columboola substation includes the connection points to the Ergon distribution network. For this section, QGC has determined a static loss factor of 1.001 based on engineering studies and actual experience of losses over this network based on historical metering data.

The second section involves a number of loads connected to the Bellevue 132kV/33kV substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Bellevue substation. The loss factor for this section of the Central Network is determined by dividing the load measured at the meters at the Bellevue substation by the sum of the metered loads measured at the 33kV switchboards in that half hour to give a dynamic half hourly loss factor based on actual measured losses.



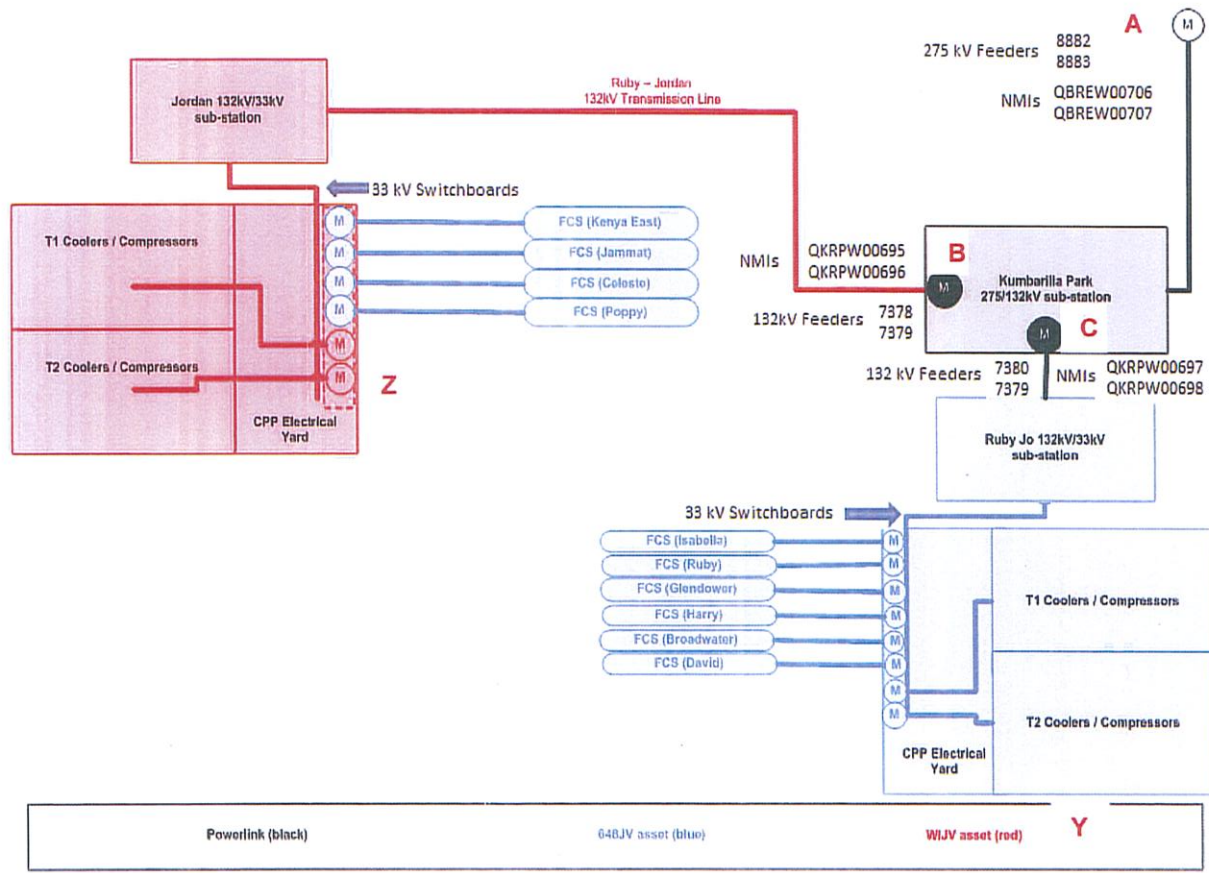
## Northern Network

The Northern Network broadly comprises:

- the Wandoan South 275/132kV substation at which the connection point to the Ergon distribution network is located;
- a 132kV feeder connecting the Wolleebee Creek 132kV/33kV substation to the Wandoan South 275/132kV substation; and
- a number of loads connected to the Wolleebee Creek substation, each of which is separately metered at the 33kV switchboards [at the CPP electrical yard connecting to] / [at] the Wolleebee Creek substation.

The loss factor for the Northern Network is determined by dividing the load measured at the connection point at the Wandoan South substation by the sum of the metered loads at the 33kV switchboard on a half hourly basis. This gives a dynamic half hourly loss factor on that feeder based on actual measured losses.

# Attachment 2 - Methodology for calculating the DLFs for the Southern Network



## Methodology

Each of meters A, B and C are Type 1 meters. All other meters on the diagram are Type 2 meters.

The loss factor applicable for the 8882 and 8883 275kV feeders is determined for each half hour using the following formula:

$$DLF = A / (B + C)$$

Where:  
 A = the average of the meters at the 275 kV feeders (8882 and 8883)  
 B = the average of the meters at the 132 kV feeders (7378 and 7379)  
 C = the average of meters at the 132 kV feeders (7379 and 7380)

The loss factor applicable to Ruby-Jordan 132KV transmission line is determined for each half hour using the following formula:

$$DLF = B / Z$$

Where:  
 B = as above  
 Z = Load measured by the meters at Z

The loss factor applicable to [the loads connecting to the Ruby Jo substation] is determined for each half hour using the following formula:

$$DLF = C / Y$$

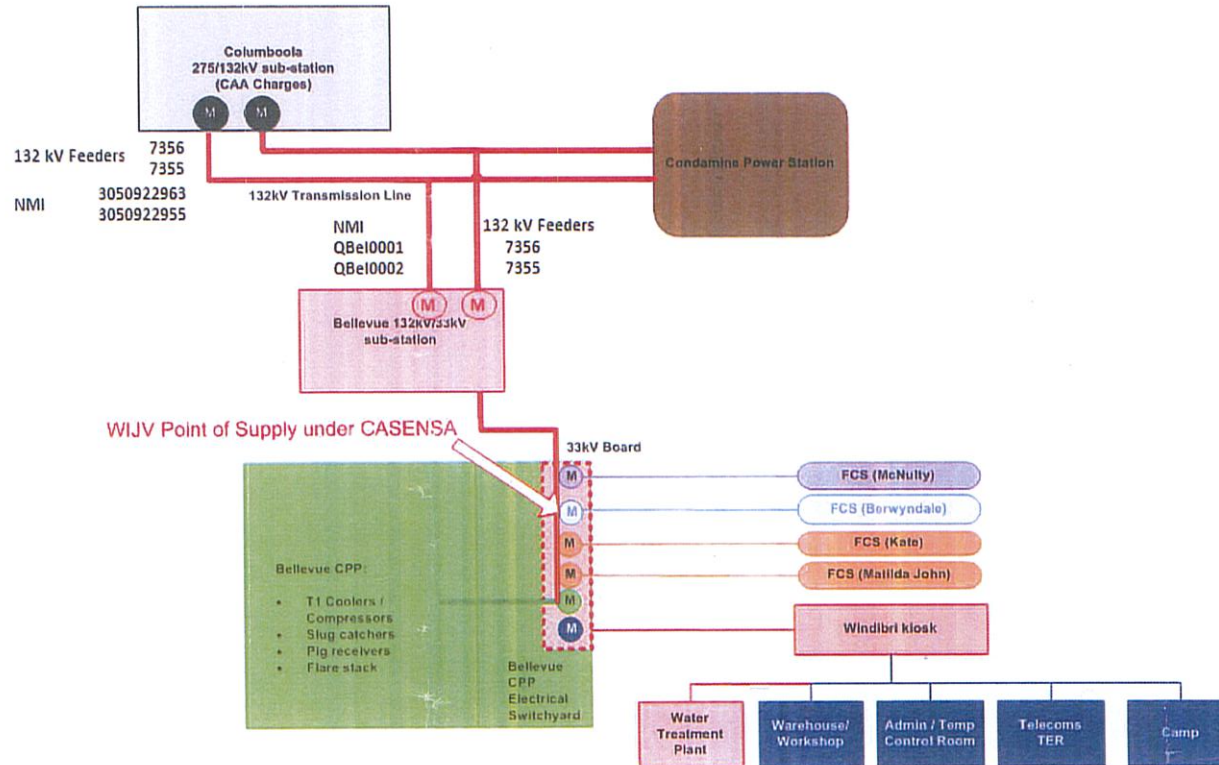
Where:  
 C = as above

Y = Load measured by the meters at Y

## Formulae for determining loss factors

Dynamic Loss Factors (Calculated every 30 minutes):  
 $DLF_{KP\_B} = (QBREW00706 + QBREW00707) / (QKRPW00695 + QKPRW00696 + QKRPW00697 + QKRPW00698)$   
 $DLF_{R\_KP} = (QKRPW00697 + QKRPW00698) / \text{Sum}(i=1 \text{ to } 28) BC18001Hi$   
 $DLF_{J\_KP} = (QKRPW00695 + QKRPW00696) / \text{Sum}(i=1 \text{ to } 28) BC14001Hi$   
 $DLF_{J\_B} = DLF_{J\_KP} \times DLF_{KP\_B}$   
 $DLF_{R\_B} = DLF_{R\_KP} \times DLF_{KP\_B}$

## Attachment 3 - Methodology for calculating the DLFs for the Central Network



### Methodology

The loss factor for the 132kV feeders (7355 and 7356) connecting the Condamine Power Station, Bellevue 132kV/33kV substation to the Columboola 275kV/132kV substation is a static loss factor, of 1.001. The static loss factor of 1.001 is based on engineering studies and the history of actual losses on these lines.

For the remainder of the Central Network which connects the loads to the Bellevue substation, a dynamic loss factor is determined for each half hour using the following formula:

$DLF = \text{Load at Bellevue} / \text{the sum of the loads of the meters at the 33kv switchboard.}$

Powerlink   QGC   610JV   632JV asset   100% QGC (brown)   676JV - WIJV Dedicated asset   620JV   WIJV asset

### Formulae for determining loss factors

Virtual meter:

$$CPS(\text{Generation @ Columboola}) = (3050922963 + 3050922955) - 1.001 \times (QBel0001 + QBel0002)$$

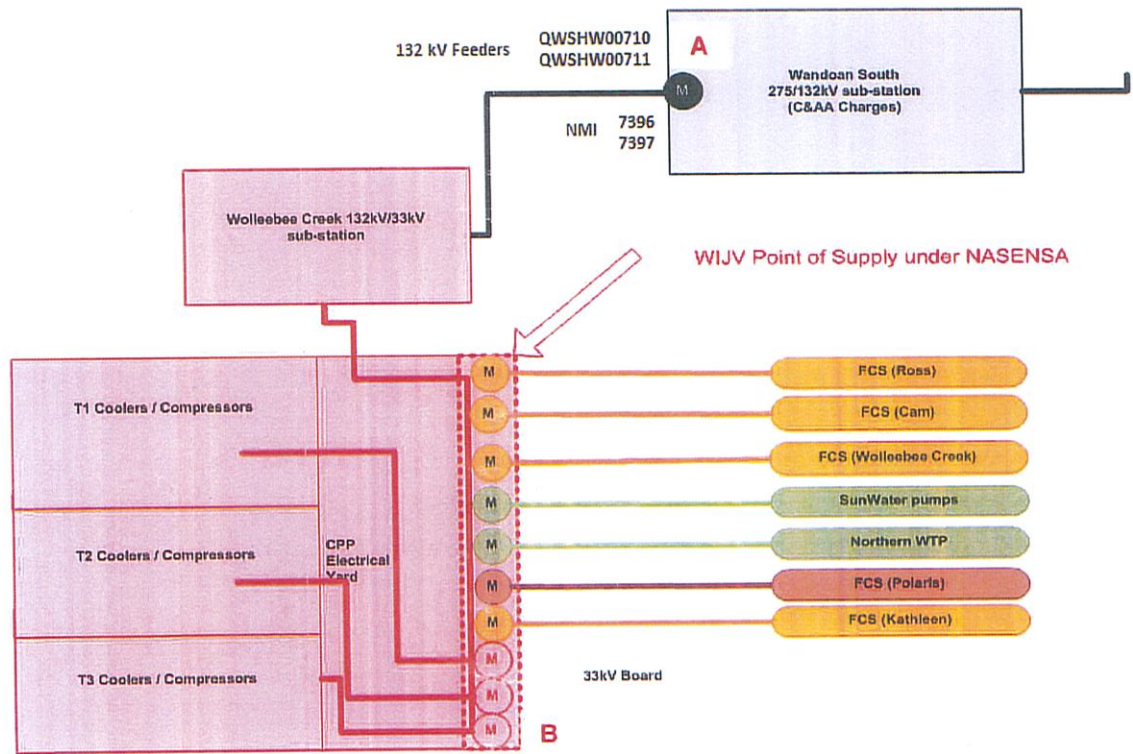
$$\text{Bellevue (Load @ Columboola)} = 1.001 \times (QBel0001 + QBel0002)$$

Dynamic Loss Factors (Calculated every 30 minutes):

$$DLF_{\text{Bel33\_Bel132}} = (QBel0001 + QBel0002) / \text{Sum (i=1 to 28) BC07001Hi}$$

$$DLF_{\text{Bel33\_Col}} = 1.001 \times DLF_{\text{Bel33\_Bel132}}$$

## Attachment 4 - Methodology for calculating the DLFs for the Northern Network



### Methodology

The loss factor applicable to the Northern Network is determined for each half hour using the following formula:

$$DLF = A / B$$

Where:

A = the average of the meters at the 132 kV feeders (710 and 711)

B = the sum of the loads of the meters at B

### Formulae for determining loss factors

Dynamic Loss Factors (Calculated every 30 minutes):

$$DLF\_Wck\_Wol = (QWSHW00710 + QWSHW00711) / \text{Sum } (i=1 \text{ to } 28) BC24001Hi$$