HILL MICHAEL
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NETWORK SERVICE PROVIDER

DISTRIBUTION LOSS FACTOR

ANGLO COAL

MORANBAH NORTH COAL NSP

AUSTRALIAN ENERGY REGULATOR

FINANCIAL YEAR 2010-11

(AER REFERENCE: M2008/112)

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TABLE OF CONTENTS

1. SUMMARY

The terms of Hill Michael's engagement with Capcoal Network Service Provider (NSP) include calculation of distribution loss factors in accordance with Section 3.6.3 (i) of the National Electricity Rules (NER). An extract of the relevant clause from the current version (Version 24) of the NER is given below:

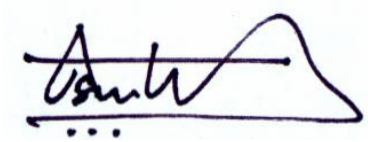
"Each year the Distribution Network Service Provider must determine the distribution loss factors to apply in the next financial year in accordance with clause 3.6.3(g) and provide these to NEMMCO for publication by 1 April. Before providing the distribution loss factors to NEMMCO for publication, the Distribution Network Service Provider must obtain the approval of the AER for the distribution loss factors it has determined for the next financial year."

Hill Michael has calculated the distribution loss factors based on the metered data for 2009 and the proposed generation and mine load projections for the financial 2010-11. The estimates of loads are subject to change. The embedded generation is dependant on the mine for fuel (coal seam methane gas), therefore, changes to the production level of the mine will impact the generation output.

The site specific DLF calculated using a Marginal Loss Factor (MLF) approach is **0.9876** for the EDL embedded generation connected to the **Moranbah North Coal Mine NSP**. This distribution loss factor has been calculated in accordance with the methodology approved by the QCA as described in **Report NCM 17699 Determination of Distribution Loss Factors for Embedded/Local Generators**.

In addition to the NER obligations, as required by the Australian Energy Regulator, this report has been provided to IES (Intelligent Energy Systems) for independent positive certification. Additional supporting evidence has been provided to IES to enable independent verification of calculations.

SIGNED, on the 05th day of February 2010



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2. METHODOLOGY AND CALCULATIONS

2.1 METERED DATA - GENERATION AND CONNECTION POINT

The reconciled metered data for the parent meter and the revenue meter at the generator (National Metering Identifiers are given below) have been obtained from the authorised Metering Provider.

Parent NMI	QDDD000005
TNI / MDA	MRN / Ergon Energy
Generator NMI	7102000038

Below is the summary of the half hourly metered data based on the most recent data available for a consecutive 12 month period at the time of determining loss factors. The mine load is estimated based on the difference between the connection point and the generation metered data.

- Connection Point (MWh): This is the total energy from connection point meter.

  Net negative energy indicates that the energy provided by generation is higher than the energy consumed by the load for that month. The converse is true for Net positive energy.

- Generation (MWh): This is the monthly energy output of the generator measured at the generator revenue meter.

- Estimated Mine Load (MW): Sum of Connection Point (MWh) and Generation (MWh) converted to MW. The conversion between MWh to MW is calculated based on 24 hours a day operation of the mine.

Date	Connection Point (MWh)	Generation (MWh)	Estimated Mine Load (MW)
Jan-09	2,860.39	4,572.34	9.99
Feb-09	205.09	8,386.85	12.79
Mar-09	-8,025.16	16,330.91	11.16
Apr-09	-10,049.61	17,744.20	10.69
May-09	-15,957.02	24,458.49	11.43
Jun-09	-20,325.38	28,823.01	11.80
Jul-09	-21,234.90	30,683.39	12.70
Aug-09	-22,323.39	31,231.34	11.97
Sep-09	-21,291.95	28,830.58	10.47
Oct-09	-20,935.84	28,955.57	10.78
Nov-09	-18,095.48	27,038.93	12.42
Dec-09	-18,618.69	27,721.98	12.24

Table 1: Metered Data for 2009

2.1.1 Generation and Load Projection for 2010/11

A planning meeting was co-ordinated between the mine and the generator, to obtain the projection from the mine (load) and the generator.

Generation Projection: EDL Power Station advises the 40 MW of installed capacity (27,000 kWh per month) will be available in 2010/11. This availability takes into account contingencies and planned outages.

Mine Load Projection: Moranbah North Coal Mine load is assumed based on the available historical data in 2009.

The Table 2 below shows the generation forecast of EDL power station and mine loads.

Date	Generation (kW)	Generation (MWh)	Mine Load (kW)	Mine Load pf	Mine Load (MVA)
Jul-10	36,290	27,000	12.70	0.70	18.14
Aug-10	36,290	27,000	11.97	0.70	17.10
Sep-10	37,500	27,000	10.47	0.70	14.96
Oct-10	36,290	27,000	10.78	0.70	15.40
Nov-10	37,500	27,000	12.42	0.70	17.74
Dec-10	36,290	27,000	12.24	0.70	17.48
Jan-11	36,290	27,000	9.99	0.70	14.27
Feb-11	40,179	27,000	12.79	0.70	18.27
Mar-11	36,290	27,000	11.16	0.70	15.95
Apr-11	37,500	27,000	10.69	0.70	15.27
May-11	36,290	27,000	11.43	0.70	16.32
Jun-11	37,500	27,000	11.80	0.70	16.86

Table 2: Forecast Data for 2010-11

It is to be noted that the forecast load at Grosvenor Mine has a target commencement date of Q1 2012.

2.1.2 Network Connection Points

The Moranbah North Coal Mine Network Service Provider (MNCNSP) owns and operates the 66 kV distribution network which is connected to the Ergon Energy Corporation Limited (EECL) Moranbah substation.

The embedded generation owned and operated by EDL will be the only customer on the MNCNSP network; subsequently MNCNSP will have only one distribution network connection point. The mine is a customer of EECL and the mine distribution network connection point is located at the Moranbah 66 kV busbar. The mine connection point is also the MNCNSP connection point to the EECL network service. The EDL embedded generator distribution network connection point is on the MNCNSP 66 kV network.

Figure 1 below shows the location of the connection points and the network for which losses are calculated.

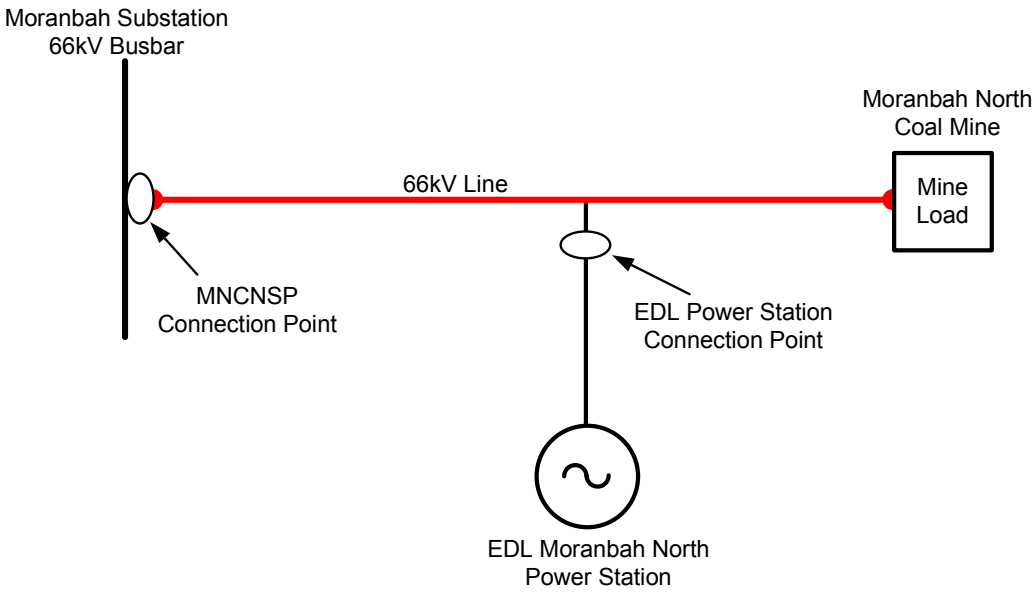

Figure 1: Simplified Representation of the Network

2.1.3 Methodology

EDL Generator DLF Calculation

MNCNSP has one connection point on its distribution network and the site specific DLF for this connection point has been calculated in accordance with the methodology approved by the Queensland Competition Authority (QCA) as described in **Report NCM 17699 Determination of Distribution Loss Factors for Embedded/Local Generators**.

The DLF is a static loss factor which is applied to the embedded generator distribution network connection point for the full financial year. The steps undertaken to calculate the DLF are summarised below.

1. Request expected mine consumption and embedded generation forecasts for the 2010-11 financial year.

2. Prepare and review the network model for the MNCNSP distribution network by incorporating any proposed changes to the network occurring in the period leading up to the financial year for which the embedded generator DLF is being calculated.

   The PSS/SINCAL network model (given in Attachment 1) represents the following:

   a. Moranbah (MRN) 66 kV connection point as an **infinite bus**;

   b. Moranbah North Mine load at the 66 kV busbar at the Mine Boundary Substation;

   c. EDL Generation Tee off to MNCNSP at the generator connection point.

3. Using the Network Model and Load Flow Analysis, the following steps are performed.

   - Note the loss on the NSP network for initial generation (A). The NSP network is between the 66kV MNCNSP connection point at Moranbah Substation and Moranbah North Coal Mine connection point.
   - Increment the generation by 1 MW and note the new loss on the NSP Network (B).
   - Run a set of load flow studies for each month of the next financial year using the forecast mine load and embedded generation data.
   - The loss due to the increment in generation per MW is calculated (B-A)/1000.

4. Calculate the MLF and DLF in accordance with the methodology approved by the QCA as described in **Report NCM 17699 Determination of Distribution Loss Factors for Embedded/Local Generators**.

2.1.4 Distribution Loss Factor

The loss under existing generation on the NSP network is noted (A), then the generation is incremented by 1 MW and the new loss on the NSP network is observed (B). The difference in the loss after the 1 MW increment is (B-A)/1000 per MW. The marginal loss factor is 1 less the loss per MW of generation increment.

The volume weighted DLF is weighted on the average forecast generation per month**. It is to be noted that the calculations for this year has lower network losses compared to last year as the calculations for this year has been refined to exclude the losses of EDL's Network Connection assets.**

Period	A (kW) NSP Loss	B (kW) NSP Loss for Increment in Generation	MLF [1 - (B-A)/1000]	DLF [SQRT (MLF)]
Jul-10	334	357	0.9770	0.9884
Aug-10	342	366	0.9760	0.9879
Sep-10	393	419	0.9740	0.9869
Oct-10	358	382	0.9760	0.9879
Nov-10	365	389	0.9760	0.9879
Dec-10	339	362	0.9770	0.9884
Jan-11	370	395	0.9750	0.9874
Feb-11	427	454	0.9730	0.9864
Mar-11	352	377	0.9750	0.9874
Apr-11	389	415	0.9740	0.9869
May-11	349	373	0.9760	0.9879
Jun-11	373	398	0.9750	0.9874
	Volume Weighted Average DLF			**0.9876**

Table 3: Volume Weighted Average DLF

ATTACHMENT 1 – SCHEMATIC OF MORANBAH NORTH COAL MINE NSP

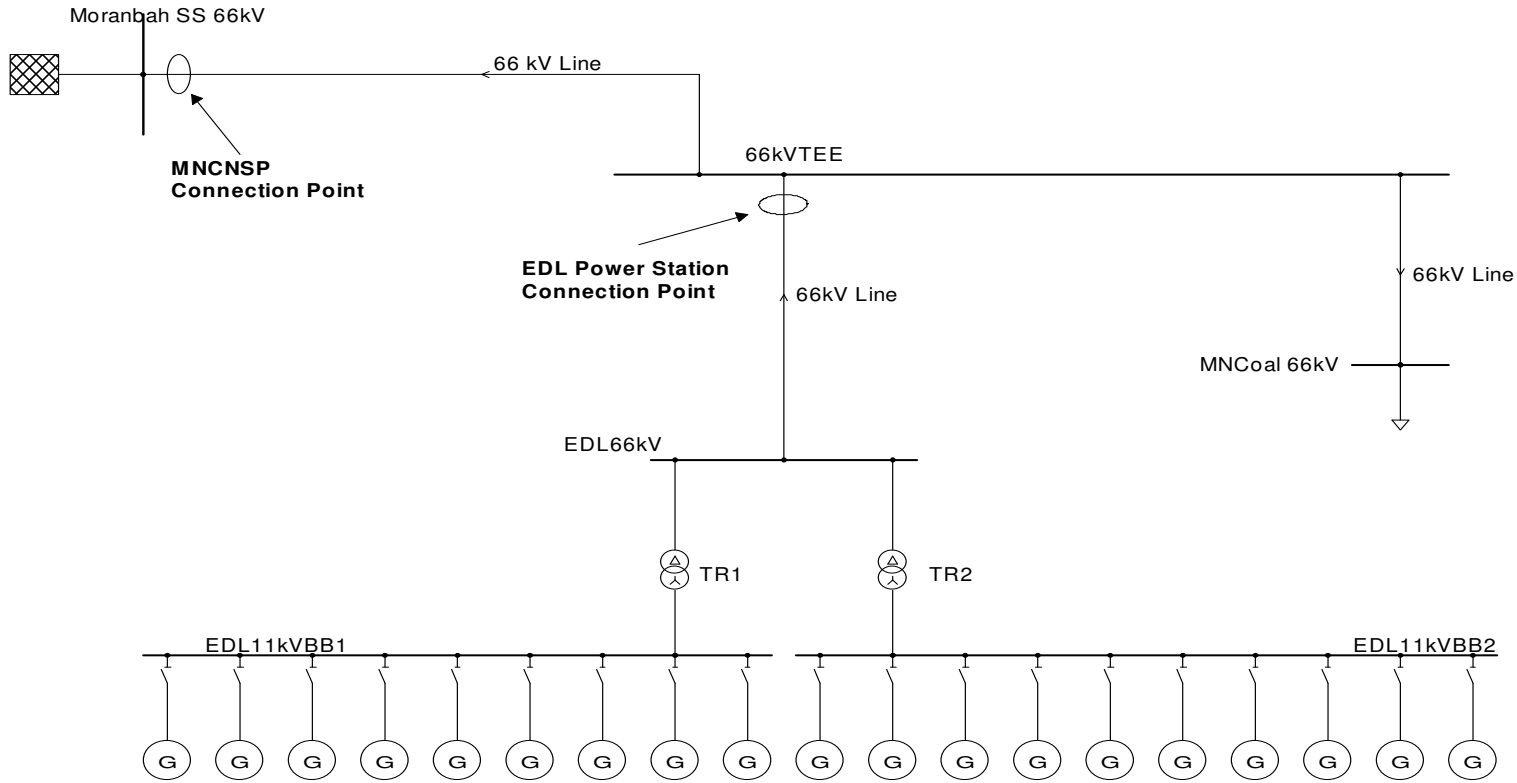

Figure 2: Moranbah North Coal NSP Network as modelled in PSS/SINCAL