Request for Information/Request for Proposals

Projected Transmission and Distribution Network and 275/66 kV Connection Point limitations

Electricity Supply to the Southern Suburbs of Metropolitan Adelaide

South Australia

ElectraNet SA and ETSA Utilities
April 2004

Disclaimer

While care was taken in preparation of the information in this discussion paper, and it is provided in good faith, ElectraNet SA and ETSA Utilities accepts no responsibility or liability for any loss or damage that may be incurred by any person acting in reliance on this information or assumptions drawn from it. This discussion paper has been prepared for the purpose of inviting information, comment and discussion from interested parties. The document has been prepared using information provided by a number of third parties. It contains assumptions regarding, among other things, economic growth and load forecasts that may or may not prove to be correct. All information should be independently verified to the extent possible before assessing any investment proposals.

CONTENTS

1. Introduction

This Request for Information (RFI)/Request for Proposals (RFP) document is provided to Code Participants, Interested Parties, and the public to make available information regarding the forecast adequacy of the electricity supply system that serves the Southern Suburbs of Adelaide and the semi-urban and rural region that extends southwards down the Fleurieu Peninsula.

This RFI/RFP seeks comment and information from Code Participants and Interested Parties, and from potential solution providers, regarding possible solutions to the projected Transmission and Distribution System limitations forecast to occur in the Southern Suburbs electricity supply system that are described in detail within section 5 of this document.

Corrective action will be required by the dates provided in this document if a reliable electricity transmission and distribution supply is to be maintained to the Southern Suburbs following the occurrence of unplanned credible single contingency events.

Because of the interaction between the transmission system operated by ElectraNet SA and the 66 kV sub-transmission system operated by ETSA Utilities, projected network limitations on one system can reflect on the other system and vice-versa. Similarly a solution to a limitation on one network can assist or detract from the performance of the other network. For this reason the development of the Southern Suburbs electricity supply system is being jointly addressed by ElectraNet SA and ETSA Utilities to ensure that the optimum and most cost effective development that meets the overall needs of both parties is implemented, ultimately resulting in the lowest practical infrastructure costs to electricity consumers.

This RFI/RFP has been prepared jointly by ElectraNet SA and ETSA Utilities to meet the consultation requirements of both the National Electricity Code (NEC) and of Essential Services Commission of South Australia (ESCOSA) Electricity Industry Guideline 12 – Demand Management for Electricity Distribution Networks (EGL 12).

This paper is an integral part of ElectraNet SA's and ETSA Utilities' approach to meeting their obligations under Clause 5.6.6 of the NEC that ensures the adoption and implementation of the most cost-effective solution(s) to future network limitations on the system. Similarly, this paper forms part of the process undertaken by ETSA Utilities to meet its obligations under the ESCOSA Guidelines to ensure adequate and appropriate consideration has been given to Demand Management (as that term is defined in EGL 12) solutions before making an investment decision for an Eligible Major (Distribution) Network Project (EMNP).

1.1. Projected Transmission and Distribution Network Limitations – Southern Suburbs of Adelaide

ElectraNet SA and ETSA Utilities have undertaken Joint Planning of the electricity transmission and sub-transmission system that supplies the Southern Suburbs and rural electricity loads south of the Adelaide CBD, including the Fleurieu Peninsula, Kangaroo Island, and Victor Harbor. The results of these joint-planning studies have identified several projected network limitations on both the transmission and distribution systems that will require remedy by the summer of 2005/06.

The projected network limitations in the Southern Suburbs fall into the following areas:

- Item 1 - Projected transmission system limitations involving the 275 kV transmission lines that supply the 275/66 kV bulk supply points in the Southern Suburbs region;
- Item 2 – Projected transmission system limitations involving the installed capacity of the 275/66 kV transformers in the 275/66 kV bulk supply substations in the Southern Suburbs;

- Item 3 – Projected distribution system limitations on the 66 kV sub-transmission lines that exit Happy Valley substation and supply the northern part of the Southern Suburbs supply system, and;
- Item 4 – Projected distribution system limitations on the 66 kV sub-transmission system that supplies the 66/11 kV substations at Lower Mitcham, Kingswood, North Unley, Keswick, Plympton, Glenelg North, and Clarence Gardens.

Interested Parties and solution providers should be cognisant of the potential interaction of the above items with the City and Eastern Suburbs supply system that abuts the northern part of the Southern Suburbs supply area when seeking further information from both ETSA Utilities and ElectraNet SA and when formulating their submissions and proposals.

1.2. Purposes of the Discussion Paper

The purposes of this discussion paper are to:

- Provide information about the existing electricity transmission and distribution systems that supply the Southern Suburbs of Adelaide;
- Provide information about projected network limitations and the expected time at which action must be taken to meet service standards and maintain system reliability under normal operating conditions and following a credible single contingency event;
- Seek information on solutions to the projected limitations in the Southern Suburbs that may be able to be provided by solution providers other than ETSA Utilities and ElectraNet SA, and;
- Explain the process being used to obtain and evaluate alternative solutions.

1.3. Discussion Paper Context

ElectraNet SA and ETSA Utilities are required to ensure that their electricity supply networks are operated with sufficient capacity to provide network services to customers in accordance with the provisions of the National Electricity Code (NEC), the South Australian Transmission Code (SATC), and the South Australian Distribution Code (SADC) as applicable[1].

However, the two organisations are subject to different regulatory requirements in terms of identifying and evaluating options to ensure these supply obligations are satisfied. This document has been developed as a critical step in meeting both sets of requirements. This is the reason this document is referred to as both a "Request for Information" and a "Request for Proposal".

1.3.1. Request for Information - ElectraNet SA

ElectraNet SA is the principle transmission network service provider in South Australia. It is a privately owned company that has a long term lease for the operation, maintenance, and development of the South Australian transmission system which comprises plant and equipment mainly operating at voltages of 132 kV and above. ElectraNet SA is registered with NEMMCO as a Transmission Network Service Provider (TNSP).

If the technical limits or reliability requirements of its transmission system are forecast to be exceeded, ElectraNet SA is required to notify Code Participants within the time required for corrective action. Prior to construction of any major network augmentation, ElectraNet SA must also meet the following regulatory requirements[2]:

[1] *SA Transmission Code and SA Distribution Code available on ESCOSA website (www.escosa.sa.gov.au)*
[2] *As set by the ACCC and contained in Chapter 5 of the National Electricity Code.*

- Consult with Code Participants and interested parties regarding alternative solutions, including those which may be provided by solution providers other than ElectraNet SA such as local generation, market network services, distribution services and demand side initiatives;
- Demonstrate proper consideration of various market development scenarios, including variations in electricity demand growth rates, and the ability of new or proposed demand-side responses and/or new or proposed generation capacity to satisfy projected network limitations, and;
- Ensure that the recommended solution meets reliability requirements at the lowest total net present value cost when compared with other feasible solutions, in accordance with the Regulatory Test promulgated by the Australian Competition and Consumer Commission (ACCC).

As the first step in meeting these obligations in relation to identified transmission network limitations (such as Item 1 in section 1.1 above), a "Request for Information" is issued by ElectraNet SA.

1.3.2. Request for Proposal - ETSA Utilities

ETSA Utilities is the partnership of Cheung Kong Infrastructure Holdings Ltd. (CKI) and Hong Kong Electric International Ltd (HEI). It is a privately owned company that has a 200 year lease for the development, design construction, operation, and maintenance of the South Australian electricity distribution network, which comprises plant and equipment mainly operating at voltages of 66 kV and below.

ETSA Utilities is registered with NEMMCO as a Distribution Network Service Provider (DNSP) and is the principal DNSP operating in South Australia. ETSA Utilities is responsible for the distribution of electricity to all distribution grid connected customers within the State.

Under the requirements of the National Electricity Code (NEC) and ESCOSA Guideline 12 (EGL 12), ETSA Utilities is required to:

- consult with Code Participants and Interested Parties to meet the joint requirements of the NECA and EGL 12. Consultation is specifically required when ETSA Utilities has identified a possible Eligible Major Network Project (EMNP – as that term is defined in EGL 12) and when the estimated cost of a distribution network augmentation reaches a significant level;
- Carry out a Reasonableness Test as outlined in EGL 12 (see below) and if this is satisfied, issue a "Request for Proposal" (RFP), and;
- Evaluate Proposals submitted in response to the RFP in accordance with EGL 12, and National Electricity Code obligations including the ACCC Regulatory Test where applicable. Specific obligations related to the evaluation, content of submissions etc are outlined below and in section 7.0.

ETSA Utilities has undertaken a Reasonableness Test in accordance with EGL 12 and found that the Southern Suburbs projected distribution network limitation meets the requirements of this test. This document is being used to publicly announce the findings of the Reasonableness Test, outline the consultation process being undertaken, detail the projected network limitations applying to the Southern Suburbs area, as well as being a "Request for Proposal" under EGL 12.

1.4. The Reasonableness Test

The estimated cost of any distribution network solution that would overcome the Southern Suburbs projected distribution network limitation is in excess of $2M. As such these developments would classify as Eligible Major Network Projects (EMNP). Consequently it is necessary to undertake a Reasonableness Test for the Southern Suburbs project.

The Reasonableness Test is used to determine if it is appropriate to issue an RFP in respect of a projected distribution network limitation. The Reasonableness Test makes it mandatory to issue a RFP for projects with an estimated cost in excess of $2M.

As the estimated costs of the distribution solutions that would overcome the projected distribution network limitations in the Southern Suburbs are in excess of $2M the Southern Suburbs project is deemed to meet the Reasonableness Test. This document incorporates an RFP for the distribution aspects of these projected limitations.

1.5. Specific Requirements for a response to a RFP

The RFP process is specifically related to projected network limitations on the ETSA Utilities distribution network and explicit requirements apply to the consultation for an RFP, the evaluation of Proposals that are submitted in response to an RFP and the timeframes for the process.

In order to be compliant, a Proposal submitted in response to an RFP must contain at a minimum the information listed in section 7.3 of this document. A proponent may submit a draft Proposal to ETSA Utilities up to 12 weeks prior to the due date for submissions in order to confirm that the Proposal conforms to the requirements of the RFP. Where such confirmation is sought, ETSA Utilities will respond as soon as possible and in any case 6 weeks before the due date of the submission.

ESCOSA Guideline 12 also specifies evaluation requirements on ETSA Utilities where an RFP has been issued. The process for evaluation in accordance with these requirements is detailed in section 7.4.1. The announcement of the outcomes will be released no later than 13 weeks after the closing date for submissions.

1.6. Status of RFI/RFP

By issuing this RFI/RFP neither ElectraNet SA nor ETSA Utilities is under any obligation to select any particular Proposal, negotiate with any particular proponent, or enter into any agreement with a proponent.

ElectraNet SA and ETSA Utilities will not be legally bound in any way or otherwise obligated to any person who may receive the RFI/RFP or to any person who may submit a Proposal. At no time will ElectraNet SA or ETSA Utilities be liable for any costs incurred by the Proponent in the assessment of this RFI/RFP, any site visits, obtainment of further information from ElectraNet SA or ETSA Utilities or the preparation by the Proponent of its Proposal to this RFI/RFP.

1.7. Co-ordination and Closing Date

The closing date for submissions to this RFI/RFP is 26 May 2004 for Item 1 and 1 October 2004 for Item 2, 3 and 4. Items 1 to 4 are outlined in section 1.1.

Requests for additional information or clarification regarding this RFI/RFP should be directed to:

Organisation	ElectraNet SA	ETSA Utilities:
Name	Hugh Westphalen	
Title	Network Customer Manager,	
Postal	ElectraNet SA, PO Box 7096 Hutt Street Post Office, Adelaide, South Australia, 5000	**Final Proposal:** ETSA Utilities Tender Box No: 1 1 Anzac Highway Keswick South Australia 5035
Email	*Westphalen.Hugh@electranet.com.au*	**Draft Proposal, or Requests for additional information:** *requestforproposals@etsautilities.com.au*
Telephone	(08) 8404 7221	
Facsimile	(08) 8404 7447	

ETSA Utilities will respond in writing to all enquiries obtained during the Request for Proposals process, with a copy of all questions and responses being provided to all registered Interested Parties.

The RFPs must be lodged with ETSA Utilities at the above address by 4:00 pm on the closing date for submissions given above. Three copies of the Proposal are to be provided.

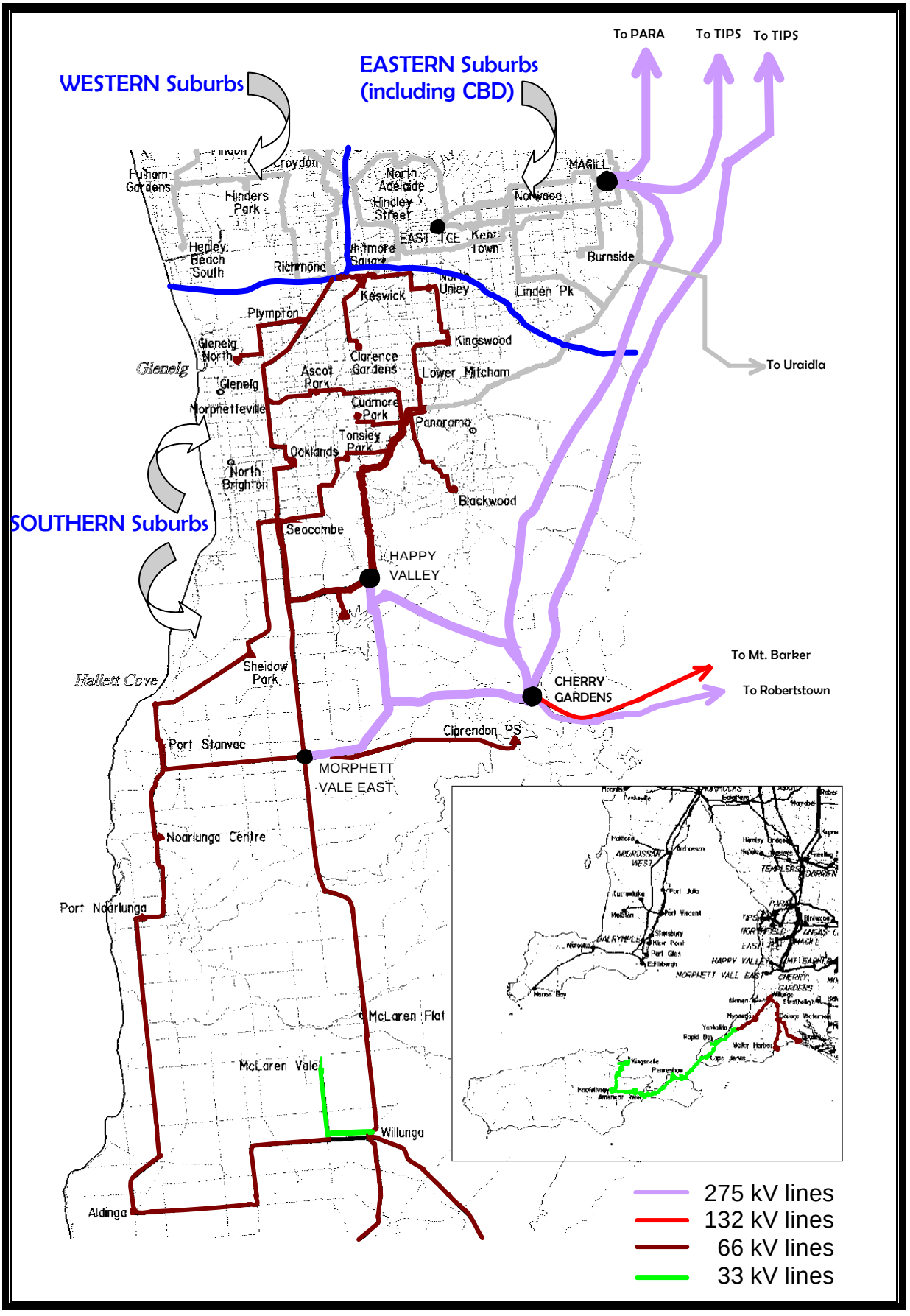
2.0 Existing Supply System to the Southern Suburbs of Adelaide

2.1 Geographic Region

The geographic region of the State that is being considered is that area immediately to the south of the Adelaide Central Business District (CBD) and is shown graphically on Diagram 1. It comprises the metropolitan area south of Greenhill Road and west of Glen Osmond Road, and includes the rapidly developing residential areas around Sheidow Park, Morphett Vale East and Seaford, and the semi-urban and rural region that extends still further beyond this to Victor Harbor, Rapid Bay and Kangaroo Island.

DIAGRAM 1

ELECTRICITY SUPPLY NETWORK FOR THE SOUTHERN SUBURBS OF METROPOLITAN ADELAIDE AND SOUTHERN SEMI-RURAL REGION



2.2 Existing Electricity System

The Southern Suburbs of Adelaide is supplied by the 66 kV meshed sub-transmission network operated by ETSA Utilities that in turn derives its supply from the 275 kV and to a lesser extent, the 132 kV transmission system operated by ElectraNet SA. The overall arrangement of this system is shown on Diagram 1.

2.2.1 The Southern Suburbs Transmission System

The 275 kV and 132 kV transmission system operated by ElectraNet SA that supplies the Southern Suburbs of Adelaide and the adjacent semi-urban and rural regions to the south is shown in Diagram 1. Primary supply to the region is provided by ElectraNet SA's Happy Valley and Morphett Vale East 275/66 kV substations that are grouped together to form a single connection point for the purposes of the South Australian Transmission Code.

Happy Valley substation contains three 180 MV.A 275/66 kV transformers, and connects to the State's 275 kV transmission network via three 275 kV lines. Two of these lines are in-feeds into the area from Magill substation (to the north), and Cherry Gardens (to the south-east). The third 275 kV line is a tie between the Happy Valley and Morphett Vale East substations that provides additional support between the sites under contingency conditions.

Morphett Vale East substation lies about 10 kilometres to the south of Happy Valley substation, and contains two 225 MV.A 275/66 kV transformers. It is supplied by two 275 kV lines. The main in-feed is from Cherry Gardens substation, about 10 kilometres to the east of Morphett Vale East, with the second line, as mentioned above, provided from neighbouring Happy Valley substation, to the north.

Cherry Gardens substation is supplied from Torrens Island Power Station "B" switchyard, to the north-west, via a single 275 kV line with a total length of almost 70 kilometres which bypasses Para substation. Cherry Gardens also derives its 275 kV supply via two 275 kV lines which connect to Robertstown substation, some 180 kilometres to the north. Robertstown is in turn connected to the Port Augusta power stations via two 275 kV circuits and to the Murraylink interconnector via two 132 kV circuits.

Magill substation is connected to Torrens Island Power Station and the SA-Victoria interconnector via Para Substation. As well as providing a major in-feed to Happy Valley substation the Magill connection point plays an integral part in providing supply to the Eastern Suburbs and the Adelaide CBD.

Cherry Gardens provides a 132 kV in-feed to the Eastern Hills 132 kV system via a single 160 MV.A 275/132 kV transformer, which can also act as a weak in-feed into the 275 kV system.

Reactive power support is installed at Cherry Gardens in the form of a 100 Mvar 275 kV static capacitor bank.

2.2.2 The Southern Suburbs Sub-Transmission and Distribution System

The Southern Suburbs load area includes all loads to the south of Greenhill Road and to the west of Glen Osmond Road and includes supply to the Fleurieu Peninsula, Victor Harbor, Rapid Bay and Kangaroo Island.

The Southern Suburbs 66 kV sub-transmission system operated by ETSA Utilities comprises an interconnected 66 kV system that derives its supply from Happy Valley and Morphett Vale East 275/66 kV substations and reticulates electricity through the region via numerous 66/11 kV and 66/33 kV substations. The southern tip of the Fleurieu Peninsula and Kangaroo Island are supplied at 33 kV and derive their supply from this via a 66/33 kV substation at Yankalilla.

The configuration of the ETSA Utilities 66 kV and 33 kV distribution networks is also shown on Diagram 1.

The Southern Suburbs 66 kV system essentially comprises two systems of 66 kV reticulation with two relatively weak ties between these systems. The first of these systems (Northern) derives its supply predominantly from Happy Valley 275/66 kV substation and is focussed on Panorama and Seacombe substations that are directly connected to the Happy Valley 66 kV bus via 66 kV lines. The second of these systems (Southern) emanates from Morphett Vale East 275/66 kV substation and connects to Willunga and Port Stanvac substations. Two 66 kV ties link these two supply systems, the first between Seacombe and Port Stanvac (via Sheidow Park) and the second is a direct link between the Happy Valley 66 kV and Morphett Vale East 66 kV busses.

The Northern 66 kV system supplied from Panorama and Seacombe substations comprises a major ring feed that picks up the load in the northern part of the southern suburbs. This ring supplies substations at Lower Mitcham, Kingswood, North Unley, Keswick and Plympton, and includes radially supplied substations at Clarence Gardens and Glenelg North. This ring terminates at Morphettville substation. A second ring feed connects Morphettville, Seacombe (via Oaklands) and Panorama (via Tonsley Park and Ascot Park) substations and includes radially supplied substations at Blackwood and Cudmore Park.

The Southern 66 kV system is supplied mainly from Morphett Vale East and supplies the southern part of the Southern Suburbs load and the semi urban and rural loads south of Willunga. This includes the 66 kV substations at Port Stanvac, Noarlunga Centre, Port Noarlunga, Seaford, Aldinga, Willunga, and radially supplied substations at Victor Harbor, Square Water Hole, Goolwa, Myponga and Yankalilla. Significant residential development is occurring in this section of the Southern Suburbs that is placing additional load on this part of the power system.

Static capacitor banks are installed throughout the 66 kV and lower voltage networks to supply reactive power to loads and support voltages. The existing load power factor measured at Happy Valley and Morphett Vale East substations is nearly unity.

2.2.3 Technical Information – Transmission

Connection Point	Basic composition
Happy Valley and Morphett Vale East combined connection point, comprising...	
Happy Valley substation	3x180 MV.A 275/66 kV transformers
Morphett Vale East substation	2x225 MV.A 275/66 kV transformers

Transmission Lines	Summer rating (MV.A)	Winter rating (MV.A)
Happy Valley-Morphett Vale East 275 kV (from Happy Valley to point where neighbouring line veers off to Cherry Gardens)	458	543
Happy Valley-Morphett Vale East 275 kV (from Morphett Vale East to point where neighbouring line veers off to Cherry Gardens)	458	543
Morphett Vale East –Cherry Gardens 275 kV (from Morphett Vale East to point where line departs from neighbouring line alignment and veers off to Cherry Gardens)	458	543
Morphett Vale East –Cherry Gardens 275 kV (from point where line departs from neighbouring line alignment after leaving Morphett Vale East, and veers off to Cherry Gardens)	458	543
Happy Valley-Cherry Gardens 275 kV (from Cherry Gardens to point where neighbouring line veers off to Magill)	458	543
Happy Valley-Cherry Gardens 275 kV (from Happy Valley to point where neighbouring line veers off to Magill)	458	543
Happy Valley-Magill 275 kV (from Happy Valley to point where neighbouring line veers off to Cherry Gardens)	916	1086
Happy Valley-Magill 275 kV (from Magill to point where neighbouring line veers off to Cherry Gardens)	916	1086
Robertstown-Cherry Gardens #1 275 kV (from Robertstown)	458	543
Robertstown-Cherry Gardens #1 275 kV (from Cherry Gardens)	458	543
Robertstown-Cherry Gardens #2 275 kV (from Robertstown)	458	543
Robertstown-Cherry Gardens #2 275 kV (from Cherry Gardens)	458	543
Mount Barker-Cherry Gardens 132 kV	182	214

2.2.4 Committed Transmission Augmentations

A second 100 Mvar 275 kV capacitor bank for the region will be installed and commissioned at Happy Valley substation in 2004. At the time of writing this report, ElectraNet SA has no other committed transmission augmentations that will impact on the 275 kV transmission network or 275/66 kV connection point that service the Southern Suburbs and adjacent southern rural area of South Australia.

2.2.5 Technical Information – Sub-transmission and Distribution

Southern Suburbs 66 kV Distribution Lines	Emergency rating (MV.A)
Happy Valley – Panorama No:1	139
Happy Valley – Panorama No:2	137
Happy Valley – Seacombe No:1	137
Happy Valley – Seacombe No:2	158
Lower Mitcham - Kingswood	156
Morphettville – Plympton	156
Panorama – Ascot Park	158
Panorama – Lower Mitcham	156
Seacombe – Oaklands	137
Happy Valley – Morphett Vale East	84
McLaren Flat - Willunga	100
Willunga – Aldinga	102
Aldinga – Seaford	102
Morphett Vale East – McLaren Flat	100
Morphett Vale East – Port Stanvac	158
Port Stanvac – Noarlunga Centre	100
Noarlunga Centre – Port Noarlunga	100
Port Noarlunga – Seaford	102
Sheidow Park – Port Stanvac	158
Seacombe – Sheidow Park	158
Seacombe – Tonsley Park	158
Kingswood – North Unley	158
Morphettville – Ascot Park	158
Morphettville – Oaklands	137
Keswick Plympton	131
North Unley – Keswick	131
Panorama – Magill	158
Panorama – Tonsley park	98

The following 66 kV lines will require substation plant changes and/or line clearance upgrades before they can achieve the above ratings:

- Happy Valley to Seacombe 2
- Lower Mitcham to Kingswood
- Kingswood to North Unley
- North Unley to Keswick
- Panorama to Magill
- Tonsley to Seacombe
- Morphettville to Ascot Park
- Seacombe to Sheidow Park
- Sheidow Park to Port Stanvac
- Noarlunga Centre to Port Noarlunga
- Port Noarlunga to Seaford
- Seaford to Aldinga

This upgrading work will be implemented within the time required in each case.

2.2.6 Committed Distribution Augmentations

ETSA Utilities committed minor distribution augmentations that materially impact on the 66 kV or 33 kV distribution networks that service the Southern Suburbs and southern rural area of South Australia have been included in the ratings published in section 2.2.5, as well as the 0.3km partial line upgrade from Keswick to North Unley, and a number of line clearance upgrades.

2.3 Existing and Committed Generation

At present there are three existing sources of generation operating in the Southern Suburbs load area. These are the diesel generators located at Kingscote on Kangaroo Island, the Cummins distillate fired power station at Lonsdale and the Starfish Hill wind powered generating station located at Cape Jervis on the Fleurieu Peninsula.

The Kangaroo Island generating plant has a total capacity of 2.4 MW and is only used when the supply from the mainland is unavailable.

The Lonsdale generating plant comprises twenty individual distillate fuelled generating units each with a rating of 1 MW. This power station connects to the 11 kV system at Port Stanvac substation and runs infrequently generally in response to the National Electricity Market. This power station has been assumed to be off-line for the purposes of analysing the existing Southern Suburbs electricity system.

The Starfish Hill wind farm comprises 23 individual wind generators each with a capacity of 1.5 MW making a total installed capacity of 34.5 MW. This generating station connects into the Southern Suburbs 66 kV sub-transmission system at Yankalilla on the Fleurieu Peninsula.

ElectraNet SA and ETSA Utilities have received for consideration several proposals for the establishment of additional wind-farms along the southern coast between Adelaide and Rapid Bay (refer Diagram 1), but in the absence of any firm commitment by the proponents to date, these possible developments have been excluded from the analysis of the existing network.

Due to the unpredictable nature of the wind that provides the energy source for wind farms, wind powered generating units are not able to guarantee that any particular level of generation will be available at any particular time in the future and hence cannot be dispatched on demand into the National Electricity Market. Because of the uncertainty and unpredictability surrounding the availability of generating capacity from wind farms, it has been assumed that no capacity is available from this source to meet network requirements.

Neither ElectraNet SA nor ETSA Utilities are aware of any existing or committed non-wind generation augmentations that will potentially impact on the 275 kV transmission network, the 275/66 kV grouped connection point, the 66 kV distribution network, or the 33 kV distribution network that service the Southern Suburbs and adjoining southern rural area of South Australia.

Generation based proponents are invited to submit proposals that they feel will meet the electricity supply requirements of the Southern Suburbs region, or expand on any previous proposal they have provided in this regard.

3.0 Load Characteristics

3.1 Strategic Significance

The Southern Suburbs of Adelaide comprise mainly residential customers, although several pockets of industrial load are also located in the area, including automobile manufacturing plants at Lonsdale and Tonsley Park with associated component manufacturing industries. A number of sizeable commercial complexes are also scattered throughout the Southern Suburbs including the Marion and Colonnades shopping centres.

Further south the load becomes increasingly rural in nature, with a significant portion of the land in the McLaren Vale area devoted to vineyards. Several semi-rural towns are also supplied by this network, with those located on the coast and in the wine-region also having a sizeable focus on tourism.

Land usage on Kangaroo Island is devoted mainly to crop and sheep farming, but aquaculture and tourism are gaining in popularity.

3.2 Load Growth Overview

Demand forecasts issued by ETSA Utilities for the connection points supplying this region suggest that the overall load growth in the area will continue at an average rate 3.5% per annum for the foreseeable future, as indicated in Table 1, (3.2% in the Northern 66 kV system and 4.2% in the Southern 66 kV system). This growth in electricity usage is largely attributable to the continuing development of housing estates with the accompanying construction of residential dwellings in the area.

The growth in electrical load in a region is dependent upon many variables including economic growth, housing and commercial development, industrial growth, spot load increases that occur in response to local requirements, and environmental conditions (predominately weather conditions). The forecasting of electrical load is based upon econometric analysis coupled with knowledge of localised developments and historical information and trends. Load forecasts are reviewed on a regular basis (typically annually), and infrequently when significant changes in circumstances occur. The load forecast provided below is subject to review and may alter as a consequence of this ongoing review within the time frames associated with this consultation process. It is based on a 10% probability of exceedence and medium economic growth.

Table 1: Forecast total electricity demand at summer peak load levels for the connection points supplying the Southern Suburbs of Adelaide, and the semi-rural area further to the south

Medium Growth Scenario												
Year	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15
Load (MW)	632.3	654.4	677.3	701.0	725.6	750.9	777.2	804.4	832.6	861.7	891.9	923.1
Power Factor (lagging)	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.97	0.97	0.96	0.96	0.96

ElectraNet SA obtains electricity demand forecasts over a ten-year horizon from ETSA Utilities. ETSA Utilities advises that these forecasts take account of any known demand management programmes in-place or committed, and also the presence of embedded generation that may reduce the forecast of demand that needs to be supplied via each transmission connection point, provided these load reduction solutions are continuously available at times of peak load.

When the demand forecasts issued by ETSA Utilities are incorporated in ElectraNet SA's transmission system modelling, it is evident that both Happy Valley and Morphett Vale East substations (that comprise the Happy Valley and Morphett Vale East grouped connection point) both show steadily increasing loads, as would be expected. The progressive peak loading on the two substations, using the medium load growth scenario, is given in Table 2.

Table 2: Forecast demand (diversified) on the two 275/66 kV connection points that provide supply to the 66 kV and 33 kV distribution networks that service the southern suburbs of Adelaide and the adjacent southern rural region

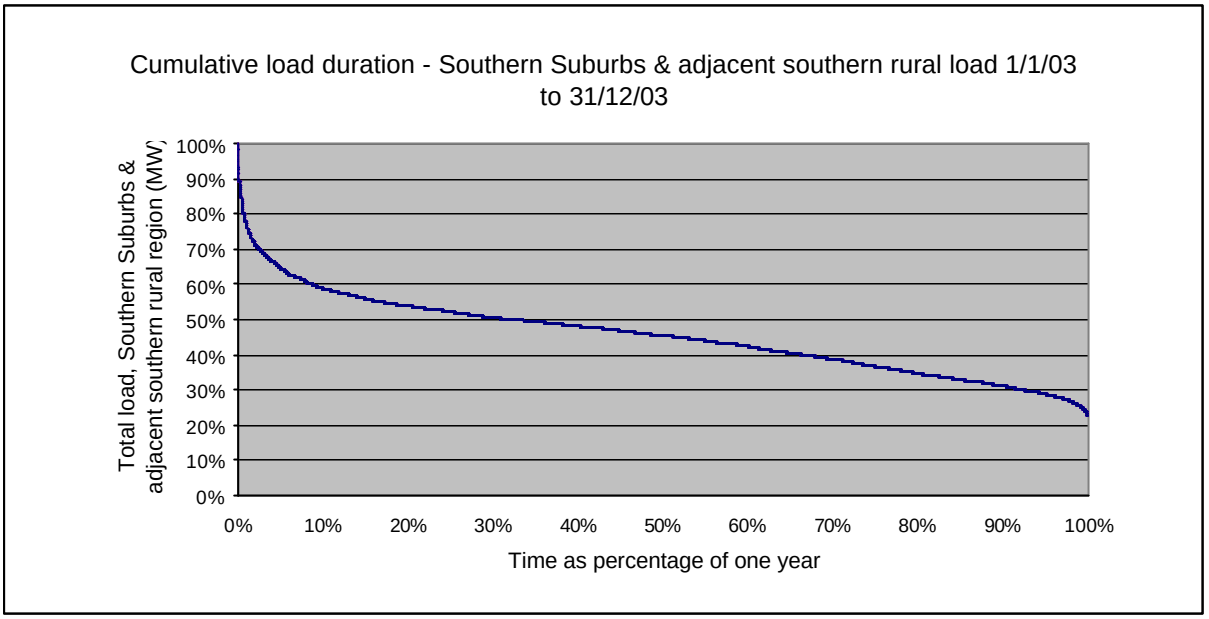
Happy Valley and Morphett Vale East combined connection point, comprising...	Projected connection point loadings under system normal conditions and at peak load times (MW)				
	Summer 2003/04	Summer 2004/05	Summer 2005/06	Summer 2006/07	Summer 2007/08
Happy Valley substation 3x180 MV.A 275/66 kV transformers	362.1	374.2	386.5	399.0	412.8
Morphett Vale East substation 2x225 MV.A 275/66 kV transformers	270.2	280.2	290.8	302.0	313.8
Total	632.3	654.4	677.3	701.0	726.6

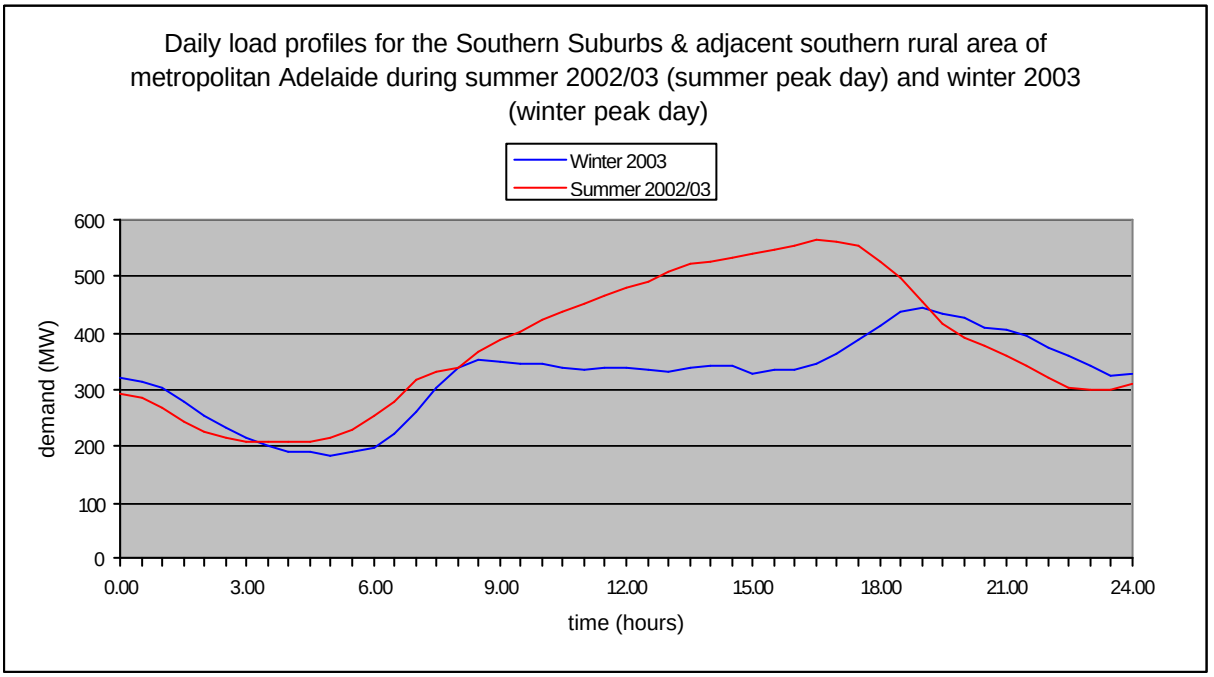
It should be noted that because of the configuration of the 66 kV network between Happy Valley and Morphett Vale East substations and the disposition and magnitude of the loads in the Southern Suburbs area the 275/66 kV transformers at these locations do not share load equally, and cannot be made to share load equally under contingency operating conditions with one transformer out of service. The resultant firm transformer capacity (i.e. with one transformer out of service) is approximately 656 MW under worst case operating conditions.

3.3 Pattern of Use

The peak electricity demand in the Southern Suburbs and adjacent semi-rural region to the south of the Adelaide metropolitan area of South Australia occurs during the summer months of the year predominately as a result of air-conditioning loads. As the rating of electrical plant typically decreases with increasing temperature it can be expected that the most onerous operating conditions for this network will occur during the summer periods. This will therefore represent the most critical period relevant to ensuring that the transmission and sub-transmission networks supplying this region of South Australia remain adequate to maintain a reliable supply.

The following graphs show the annual load duration curve for the Southern Suburbs supply area and the daily load curve for the summer and winter peak load day.





4.0 Planning Criteria

As Network Service Providers (NSPs) within the National Electricity Market, ElectraNet SA and ETSA Utilities must comply with technical standards in the National Electricity Code. In particular, requirements relating to reliability and system security contained in Schedule 5.1 of the Code are relevant to planning for future electricity needs. In addition, as licensed electricity entities in South Australia, ElectraNet SA and ETSA Utilities are required to comply with the service obligations imposed by the South Australian Transmission Code and the South Australian Distribution Code respectively. It is a requirement under these Codes and service obligations that voltage levels are kept within acceptable limits and plant is operated within its capability and ratings at all times.

The South Australian Transmission Code (SATC) allocates reliability standards for each connection (exit) point or group of connection points within the transmission network and thereby imposes specific requirements on ElectraNet for planning its transmission network. Examples of the specified levels of reliability include:

- *'N' or 'System Normal' :* Defined as the ability to supply all load with all elements of the electricity system intact (i.e. supply cannot be maintained during a single fault or contingency without loss of load).

- *'N-1' :* able to meet peak load with the worst **single** credible fault or contingency;

- *'N-2' :* able to supply all peak load during a **double** contingency

The following table summarises the service obligations for the 5 SATC categories.

SATC Category	1	2	3	4	5 + CBD
Transmission line capacity...					
• 'N'	100% of Agreed MD				
• 'N-1' (any combination of Transmission, Distribution, Generation, Load interruptibility)	Nil	2/3 of Agreed MD	100% of Agreed MD		
• 'N-1' **continuous** capability	None stated			100% of Agreed MD for single credible contingency event	
• 'N-2' (any combination of Transmission, Distribution, Generation, Load interruptibility)	None stated				'CBD' 100% of Agreed MD; remainder 50% of Agreed MD
• Restoration time to 'N' standard after outage	2 days (best endeavors)			12 hours (best endeavors)	4 hours (best endeavors)
Transformer capacity...					
• 'N'	100% of Agreed MD				
• 'N-1' (any combination of Transmission, Distribution, Generation, Load interruptibility)	Nil	100% of Agreed MD			
• 'N-1' **continuous** capability	None stated			100% of Agreed MD for single credible contingency event	
• 'N-2' (any combination of Transmission, Distribution, Generation, Load interruptibility)	None stated				'CBD' 100% of Agreed MD; remainder 50% of Agreed MD
• Restoration time to full capacity after transformer failure	4 days (best endeavors)				2 days (best endeavors)
• Spare transformer requirement	At least one spare for this Category			None Stated	
Allowed period to bring up to compliance with required contingency standard	N/A	12 months (best endeavors); maximum 3 years			

The Happy Valley and Morphett Vale East grouped connection point that supplies the Southern Suburbs of Adelaide and adjacent semi-rural region further to the south is designated as Category 4 load under the SATC. For this category of load, the following specific reliability standards must be met:

"A transmission entity shall not contract for an amount of agreed maximum demand greater than 100% of installed line capacity. A transmission entity shall provide N-1 line capacity of at least 100% of agreed maximum demand. N-1 capacity may be provided by whatever means including by the implementation of transmission system capability, distribution power system capability, generating unit capability or load interruptibility (or any combination thereof). At least 100% of N-1 capacity shall be continuously available. A transmission entity shall use its best endeavours to restore contracted line capacity within 12 hours of an interruption.

A transmission entity shall not contract for an amount of agreed maximum demand greater than 100% of installed transformer capacity. A transmission entity shall provide N-1 transformer capacity of at least 100% of agreed maximum demand. N-1 capacity may be provided by whatever means including by the implementation of transmission system capability, distribution power system capability, generating unit capability or load interruptibility (or any combination thereof). At least 100% of N-1 capacity shall be continuously available. In the event of transformer failure, a transmission entity will use its best endeavours to repair the installed transformer or install a replacement transformer within 4 days of the failure.

In the event that agreed maximum demand at a connection point or group of connection points exceeds available capacity for N-1 (for lines or transformers) as required for this category, a transmission entity will use its best endeavours to meet the standards within 12 months and, in any case, within 3 years."

Accordingly, any assessment of projected network limitations must cover the capability of the existing network to have supply capacity restored as quickly as possible, and contracted line and transformer capacity reinstated to agreed levels within the prescribed times mentioned above, in line with the requirements stipulated by the SATC for Category 4 loads, following the loss of any single element.

The Southern Suburbs supply area abuts the City and Eastern Suburbs supply area of Adelaide, which is designated as a Category 5 Load under the SATC.

5.0 Projected Network Limitations

5.1 Reliability Standards and Service Obligations

The SATC has allocated Load Category 4 status to the Happy Valley and Morphett Vale East grouped connection point. This SATC determination has the effect of allocating specific reliability standards to that connection point and thereby imposes legal requirements that ElectraNet SA, as a licensed transmission entity, must comply with when planning system augmentations that will have some bearing on that connection point.

The specific reliability standards and obligations that ElectraNet SA must comply with at the Happy Valley and Morphett Vale East grouped connection point are summarised below:

Transmission line capacity:

- *Provision of N-1 line capacity of at least 100% of agreed maximum demand;*
- *The continuous availability of at least 100% of N-1 line capacity, and;*
- *Using its best endeavours, the restoration of contracted line capacity within 12 hours of an interruption.*

Transformer capacity:

- *Provision of N-1 transformer capacity of at least 100% of agreed maximum demand;*
- *The continuous availability of at least 100% of N-1 transformer capacity, and;*
- *Using its best endeavours, in the event of transformer failure, the repair of the installed transformer or installation of a replacement transformer within 4 days of the failure.*

Furthermore, ElectraNet SA shall not contract for an amount of agreed maximum demand greater than 100% of installed line capacity or greater than 100% of installed transformer capacity. In the event that the agreed maximum demand at the grouped connection point exceeds available capacity for N-1 (for lines or transformers) as required for this category, ElectraNet SA will use its best endeavours to meet the standards within 12 months and, in any case, within 3 years.

This service standard requires that 100% of the Agreed Maximum Demand (AMD) for the Southern Suburbs must be capable of being supplied instantaneously following a contingency without any loss of customer supply in the intervening period. Accordingly, any assessment of proposals to meet the Southern Suburbs projected network limitations must consider this requirement for a continuous supply of electricity and the capability to have contracted line and transformer capacity reinstated to agreed levels within the prescribed times mentioned above.

In addition, ETSA Utilities is required to operate its power system within plant ratings and with acceptable quality of supply under reasonably expected operating conditions in order to comply with its requirements under the NEC and the SADC.

ETSA Utilities has applied the reliability requirements of the SADC to develop the metropolitan interconnected 66 kV network-planning criteria. These planning criteria will be included in the annual Electricity Supply Development Plan for ETSA Utilities Distribution System that will be published on 30 June each year from 2004 onwards. These planning criteria include:

- Substation supply will not be interrupted for a single 66 kV interconnected line outage at the forecast 100% peak demand. (This criterion excludes substations with single supplies, such as radial lines and tee-offs).
- A 66 kV interconnected line will not be loaded above its published emergency rating during single contingency conditions at the forecast 100% peak demand.
- A Transmission Connection Point substation will not be loaded above its published rating during single contingency conditions at the forecast 100% peak demand.
- SADC quality supply standards at customer supply points will be met during single contingency conditions at the forecast 100% peak demand.

5.2 Item 1 – 275 kV Transmission capacity to supply the Southern Suburbs

The Southern Suburbs derives its 275 kV supply from four 275kV circuits as described in section 2.2.1. Two of these circuits, from Robertstown – Cherry Gardens, are relatively long (180km) and therefore provide a relatively weak in-feed into Cherry Gardens. The Southern Suburbs 275 kV supply is therefore dependent on the two strong in-feeds provided to the region from Magill and from Torrens Island.

Under system normal operating conditions, the 275 kV supply system to the Southern Suburbs will be adequate for many years to come. However, analysis has shown that an outage of either one of the two critical in-feeds will result in unacceptable voltage level in the Southern Suburbs under peak load conditions beyond 2005/06.

The following table provides an indication of the level and period of load reduction that may be required under contingency operating conditions.

Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Load at risk* (MW)	0	1.0	25.6	50.9	77.2	104.4	132.6	161.7	191.9	223.1
Duration at risk (hrs)	0	0.3	7.7	14.9	21.8	28.4	34.9	41.1	47.1	52.9

* - Load at risk is the load that would not be able to be supplied from the existing transmission or sub-transmission system following the occurrence of a critical single contingency event and the implementation of contingency plans to support the remaining load. Periods may occur following a critical contingency when significantly larger portions of the total load are without supply until contingency arrangements are placed into operation.

Joint planning has been undertaken between ETSA Utilities and ElectraNet SA regarding this projected limitation of the transmission system and ETSA Utilities has advised that they do not have any economic distribution system solution to this particular situation. The cost of overcoming this projected transmission network limitation is estimated to be in excess of $10M and as such would constitute a New Large Network Asset in accordance with the NEC.

As there is no distribution system solution to this projected limitation on the transmission system, this Item 1 would not be subject to the consultation and RFP requirements relevant to ETSA Utilities under ESCOSA Guideline 12. ElectraNet SA is therefore seeking information, comments, and submissions from interested parties and solution providers via a Request for Information (RFI) only.

5.3 Item 2 – Southern Suburbs 275/66 kV Connection Point Limitations

Under single contingency operating conditions there is sufficient design 275/66 kV transformer capacity installed the Southern Suburbs load area to comply with the Category 4 service standards for transformers outlined in the SATC up until 2006/07. However, because these transformers do not share load equally and in proportion to their ratings in a practical sense the load will exceed the aggregate adjusted capacity of the connection point after the summer of 2004/05 onwards. Under a single credible contingency event this would result in an overload of the remaining 275/66 kV transformers at Happy Valley, which is not in compliance with the requirements of the NEC or the SATC to operate plant within ratings.

To accommodate future increases in the agreed maximum demand, reinforcement of this grouped connection point will be required.

The Happy Valley and Morphett Vale East grouped connection point, comprising the interconnected 275/66 kV ElectraNet SA substations at Happy Valley and Morphett Vale East, supplies the entire ETSA Utilities 66 kV-33 kV electricity supply network for the Southern Suburbs of metropolitan Adelaide and adjacent semi-rural area to the south.

Happy Valley substation consists of three 180 MV.A 275/66 kV transformers, while Morphett Vale East substation comprises two 225 MV.A 275/66 kV transformers. The meshed nature of these ElectraNet SA transformers and ETSA Utilities 66 kV lines and the location of ETSA Utilities' loads give this supply system a firm capacity of 663 MV.A or 656 MW at a power factor of 0.99 lagging.

Studies indicate that from the summer 2004/05 onwards, an outage of either the Happy Valley #3 or #4 transformer will overload the Happy Valley #2 transformer. The following table provides an indication of the level and period of load reduction that may be required.

Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Load at risk (MW)	21.3	45.0	69.6	94.9	121.2	148.4	176.6	205.7	235.9	267.1
Duration at risk (hrs)	6.9	14.1	21.0	27.7	34.2	40.4	46.4	52.3	57.9	63.4

Joint planning undertaken between ETSA Utilities and ElectraNet SA relating to transmission connection point capacity in the Southern Suburbs region indicates that a distribution solution is available for this situation and that substantial investment (>$2M) would be needed in the distribution system in order to re-allocate the power equitably between the 275/66 kV substations by utilising the customer load points at the 66/11 kV substations. For this reason, the RFP process is applicable to Item 2.

5.4 Item 3 – Southern Suburbs 66 kV Projected Limitations – Happy Valley to Panorama

Studies indicate that, by summer 2005/06, load growth in the Southern Suburbs will result in overloads on the Happy Valley – Panorama No: 1 circuit if the No: 2 circuit is out of service and vice-versa. Both Happy Valley to Panorama lines will be overloaded for an outage of the Seacombe to Oaklands circuit. Similarly, an outage of one Panorama to Happy Valley circuit will overload the Seacombe to Oaklands circuit. After 2004/5 contingency plans that are presently in place will have insufficient capacity to meet the increased loads that must be supplied by these 66 kV circuits.

Solution providers and responders should note that the loading in the above circuits is primarily due to the electrical load being drawn from the 66 kV system by customers located in the northern part of the Southern Suburbs supply region. Any proposals aimed at addressing this projected distribution network limitation will need to effectively reduce these loads to acceptable levels.

The following table provides an indication of the level and period of load reduction required.

Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Load at risk (MW)	76.9	89.0	101.1	113.6	126.6	139.9	153.6	167.8	182.5	197.6
Duration at risk (hrs)	45.9	51.4	56.6	61.6	116.4	221.1	322.3	421.0	517.1	609.5

Solution providers and responders should also be cognisant of the service obligations placed on ElectraNet SA with regard to connection point capacity and the proximity of this load to the CBD–Eastern Suburbs supply system (refer to Item 5) when formulating proposals to this projected limitation of the Southern Suburbs distribution system.

It is estimated that the cost of the network solution that would overcome this projected limitation of the distribution system would be in excess of $2M. Therefore, the RFP process is applicable to Item 3.

5.5 Item 4 – Southern Suburbs 66 kV Projected Limitations – Morphettville to Keswick to Panorama

Studies indicate that, by summer 2004/5, load growth in the Southern Suburbs will result in overloads on the Morphettville - Keswick - Panorama 66 kV sub-transmission network (that supplies Lower Mitcham, Kingswood, North Unley, Keswick, Clarence Gardens, Plympton, and Glenelg North) under contingency operating conditions following credible single contingency outages of either the Morphettville – Plympton, or the Panorama – Lower Mitcham or Lower Mitcham - Kingswood 66 kV lines. Beyond 2004/5 contingency plans that are presently in place to address these overloads will no longer be adequate to meet the forecast loads under critical outage conditions.

Solution providers and responders should note that the loading in the above circuits is primarily due to the electrical load being drawn from the 66 kV system by customers located in the northern part of the Southern Suburbs supply region. Any proposals aimed at addressing this projected distribution network limitation will need to effectively reduce these loads to acceptable levels.

The following table provides an indication of the level and period of load reduction required.

Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Load at risk (MW)	24.2	29.8	35.6	41.5	47.6	53.9	60.5	67.2	74.2	81.3
Duration at risk (hrs)	30.5	36.3	42.0	47.5	52.8	57.9	62.9	143.1	247.3	348.3

Solution providers should also be aware that, due to the interconnected nature of the distribution network, inter-relationships exist between Item 4 and Items 2 and 3 described earlier. It is estimated that the cost of the network solution that would overcome this projected limitation of the distribution system would be in excess of $2M. Therefore, the RFP process applies to Item 4.

5.6 Item 5 – CBD and Eastern Suburbs Projected Limitation

Preliminary analysis undertaken by ElectraNet SA and ETSA Utilities indicates that a projected network limitation will occur in the CBD district of the CBD and Eastern Suburbs supply area in approximately 2009/10. Given the proximity of this supply area to the projected network limitation described in Item 3 and item 4, solution providers and responders should be aware of the likely possibility of a combined RFI/ RFP being issued to address this limitation in the future. Where possible, impacts on the CBD district should be considered when approaching ETSA Utilities and ElectraNet SA for further information and when formulating proposals and submissions to Items 2, 3, and 4 above.

5.7 Factors Impacting Timing of Required Corrective Action

5.7.1 Assumed Electricity Demand

Sections 5.2 to 5.5 identified that, without corrective action, the existing Southern Suburbs power delivery system will be unable to maintain supply during single contingencies at predicted load levels for the summer of 2005/06 and beyond.

The primary driver of these projected network limitations is the forecast growth in electricity demand in the area. The 2005/06 timing conclusion is based on a load growth forecast that assumes peak summer conditions and medium economic growth, and takes into account a consideration for practical implementation times for system augmentation. Sensitivity analysis has shown that the annual load growth is of sufficient magnitude to make the need for augmentation relatively insensitive to these assumptions and would not alter the required timing for corrective action.

5.7.2 Assumed Generation Pattern

ElectraNet SA and ETSA Utilities have, under close consultation, carried out analyses examining the power flows and voltage levels on the 275 kV, 66 kV and 33 kV lines, and loadings on the 275/66 kV transformers, in the Southern Suburbs transmission, sub-transmission and distribution systems, using a variety of assumptions about plausible generation patterns from existing and proposed wind-farms and from the Cummins generating plant at Lonsdale.

It has been found that during the most critical network contingencies for the area (outage of the Magill-Happy Valley 275 kV line, the failure of either transformer #3 or transformer #4 at Happy Valley substation, or an outage of the Happy Valley to Panorama, Seacombe to Oaklands, Morphettville – Plympton or Panorama – Lower Mitcham 66 kV line at a high load period) the outcome and timing is not sensitive to dispatch from the Starfish Hill wind-farm, and insensitive to the level of generation from the Lonsdale Plant due to the location of this generation relative to the network overloads.

5.7.3 Other Factors

Given the existing electricity supply system and absence of committed augmentations no other factors have been identified that would influence the timing of projected network limitations in the Southern Suburbs region of metropolitan Adelaide and adjacent semi-rural areas to the south.

Augmentations to the distribution network may influence flows on the 66 kV system in the relevant area and to some extent the relative loading of the 275/66 kV transformers at Happy Valley and Morphett Vale East. However, because of the geographic location of the loads concerned this would have minimal impact on the need to provide increased support to the 275 kV transmission network and total 275/66 kV connection point transformer capacity required under critical network operating conditions.

5.7.4 Conclusion

Any timing recommendation requires a balance of the risks associated with variations in electricity demand, temperature, and other assumptions. Both ElectraNet SA and ETSA Utilities conclude that the capability of the Southern Suburbs transmission and sub-transmission network must be addressed by the summer of 2005/06, or as soon as possible thereafter, if supply reliability and system security are to be maintained following a single credible contingency event on either network.

6.0 Market and Other Network Impacts

The projected network limitations on the 275 kV transmission network and 66 kV sub-transmission networks supplying the Southern Suburbs of Adelaide and the adjacent semi-rural region to the south, are not particularly sensitive to market operations or generation dispatch scenarios. The need for augmentation is driven primarily by existing load locations and their forecast growth, and existing plant limitations.

Market participants may wish to consider the following when developing alternative solutions:

- Any new local generation option will be required to operate at certain times under contract with ElectraNet SA and ETSA Utilities. This will be essential for reliability purposes, and such operation will be required regardless of the pool price at the time noting that the National Electricity Code prevents a generator that is providing grid support from setting the market price.
- Because of the service obligations imposed by the SATC for Category 4 loads, stipulating an instantaneous, firm N-1 supply, it will be necessary to pre-dispatch generation at load levels above the capability of the existing transmission and distribution infrastructure to ensure that no customer load (other that that which has been contracted as interruptible) is lost as the result of a credible contingency event occurring.
- A demand side management initiative (eg programme to reduce electricity usage during the relevant peak period) must provide positive proof that it is capable of reducing flows on the relevant network elements to below emergency ratings during single network contingencies within the required time. If this reduction is not achieved, the consequence is likely to be forced and extensive customer load-shedding of prolonged duration during single contingencies, which is not an allowable outcome under the SATC and does not meet the reliability requirements of the SADC.
- Following any one of the critical transmission network contingencies for the region identified earlier in this document (outage of the Magill-Happy Valley 275 kV line, the failure of either transformer #3 or transformer #4 at Happy Valley substation, or an outage of the Happy Valley – Panorama, Seacombe - Oaklands, Morphettville – Plympton or Panorama – Lower Mitcham – Kingswood 66 kV line at a high load period), *'reducing'* the apparent 66 kV load attributable to the Southern Suburbs region within an appropriate time frame is a feasible means of avoiding 275/66 kV transformer and 66 kV line overloads, and ensuring against voltage collapse. Accordingly, any new generation proposal or a new injection point into the region would need to be connected at a suitable location on the 66 kV system (or alternatively, strategically placed on the 275 kV network and injecting into the 66 kV system) if an augmentation of the existing transmission or sub-transmission network is to be avoided or delayed for a significant period.

7.0 Assessment of Alternative Solutions

7.1 Identifying Solutions

This RFI/RFP paper, and subsequent consultation, provides an opportunity for alternative solution providers to submit details of their proposals for consideration. The information provided in this document on projected network limitations in the Southern Suburbs region of metropolitan Adelaide is intended to enable interested parties to formulate and propose feasible and definitive local generation, demand side management, and market network service provider solutions.

7.2 Criteria for Solutions

As outlined in sections 5.2 to 5.6, it is essential that action be taken as soon as possible to maintain a secure and reliable electricity supply to the Southern Suburbs and adjacent semi-rural area to the south of the Adelaide metropolitan area. However, with due consideration for delivery times for major items of plant, and the potential for delays caused by bad weather, ElectraNet SA and ETSA Utilities desire that any proposal received must be capable of being implemented and commissioned prior to the summer of 2005/6 or as soon as practical thereafter, although earlier implementation is preferable.

To assist solution providers in understanding the technical and other requirements, the following criteria that must be satisfied if solutions are to meet the underlying need for augmentation of supply to the Southern Suburbs of metropolitan Adelaide and adjacent semi-rural region to the south:

Size: Feasible options must be large enough, individually or collectively, to meet the annual increase in demand for the entire Southern Suburbs region of metropolitan Adelaide and adjacent semi-rural region to the south. Options must be able to supply at least 21 MW to eliminate the load shedding risk in 2005/06 for item 1 and 2 and 77 MW for item 3. For Items 1 and 2 a further 24 MW of capacity would be required in each subsequent year to meet average annual load growth. The capacity requirements needed to satisfy Items 3 and 4 are given in section 5.4 and 5.5 respectively.

Time of year: Options must, at a minimum, be capable of meeting this demand growth during the peak summer months. The existing system is most in need of reinforcement during the summer peak, so options that do not reliably relieve load during this period do not represent viable options. All viable options must able to support the peak summer and winter loads under any credible single contingency operating condition.

Location: To be a viable 'stand-alone' non-transmission solution, an option must reduce the contracted electricity demand that has to be supplied via the Happy Valley and Morphett Vale East combined connection point transformers, or the load in the northern part of the Southern Suburbs supply area. This implies that any stand-alone local generation option must be located so as to reduce the load supplied out of Happy Valley and Morphett Vale East substations or by the 66 kV lines from Happy Valley that supply Panorama and Seacombe 66 kV substations and the interconnected 66 kV network that originates from those sites. Transmission or sub-transmission system augmentation combined with generation outside the relevant area may be a viable solution and generation proponents interested in this approach are requested to provide a preliminary proposal to ElectraNet SA or ETSA Utilities.

Timeframe: All options should be operational before the summer of 2005/06 at the latest to ensure solution proven at least one year before latest planned completion date of network solution.

Reliability: Options must be capable of reliably delivering electricity under a range of conditions and, if a generator must meet all relevant Code requirements related to Grid connection.

Certainty: Options must be committed using proven technology and have funding and project management to deliver within the required timeframe. Corrective action is critical to the reliability of electricity supply to the Southern Suburbs region of metropolitan Adelaide and adjacent semi-rural region to the south – it is not considered appropriate to rely on uncommitted developments that may or may not proceed.

Longevity: Options can either be capable of providing feasible long-term solutions or provide a series of short-term deferrals to overcome the projected limitations in the Southern Suburbs region. The economic effectiveness of short-term deferrals will be assessed over the full ten-year period.

Evaluation: The evaluation period for this RFI/RFP is driven by the need to obtain the most cost effective development(s) over a reasonable time frame, allowing for uncertainties associated with future network developments and load and generation patterns. In the case of the Southern Suburbs the need for network supplementation is predominantly driven by load growth and future network development will be dependent on the location of this load relative to the existing connection points, the location of any new generation in the region, and any subsequent transmission and sub-transmission development needed for this purpose. As a consequence, there is considerable uncertainty associated with forecasting the future supply arrangements associated with the Southern Suburbs region and it is therefore proposed to use the minimum 10-year period of evaluation contained in the NEC to evaluate Proposals on this occasion.

Liability: If ElectraNet SA and/or ETSA Utilities decides to enter into a contractual arrangement for the provision of network services, ElectraNet SA or ETSA Utilities may require the contracting party to indemnify ElectraNet SA or ETSA Utilities against any and all liabilities, including claims, losses, actions or proceedings it or a third party may suffer should the contracting party fail to deliver the support services in accordance with ElectraNet SA's and ETSA Utilities' requirements and any applicable laws, including those governing the timeliness and standards of service. This indemnity will also apply for any claims or losses that would apply during an interim period; for example, when customers have lost supply when a generator is running up prior to supplying load, or when switching is being undertaken on the distribution network.

7.3 Information to be provided

In order to be a compliant Proposal under the RFP process, Proposals must contain the following information at a minimum:

- the name, address and contact details of the proponent making the Proposal;
- the name, address and contact details of the party responsible for the system support option (if different to above);
- a explanation of the relevance of the proposal and/ or options presented;

- if applicable to the solution being offered;
    - the size, type and location of load(s) that can be reduced, shifted, substituted or interrupted;
    - the size, type and location of generators that can be installed or utilised if required;
    - the type and location of action or technology proposed to reduce peak demand/provide electricity system support;
- the time required to implement the proposal, and any period of notice required before loads can be interrupted or generators started;
- an estimate of the expected reliability of the option offered. This could be expressed in terms of the availability factor for that portion of the required period for which the option is offered (i.e. the probability that the option will be available if called upon);
- any other relevant information, and a summary of the likely impact on consumers, e.g. in relation to power quality and reliability, etc;
- the level and availability of electricity system support from this proposal;
- the level of initial payment required ($ and/or $/kV.A);
- the level of availability payment required ($ and/or $/kV.A);
- the level of dispatch payment required; and
- any other issues considered relevant.

There are no specific regulatory requirements for a submission to a "Request for Information" process. However, it is requested that submissions addressing Item 1 contain the same information as outlined above.

7.4 **Assessment of Solutions**

The ACCC's Regulatory Test, Chapter 5 of the NEC and ESCOSA Guideline 12 require ElectraNet SA and ETSA Utilities (as applicable) to consider local generation, demand side management, and network options on an equal footing.

As the Southern Suburbs augmentation is required to meet Code reliability standards, ElectraNet SA and ETSA Utilities are required to carry out economic cost-effectiveness analysis:

"In the event an augmentation is proposed to meet an objectively measurable service standard linked to the technical requirements of Schedule 5.1 of the Code, the augmentation satisfies the Regulatory Test if it ***minimises the net present value of the cost*** *of meeting those standards having regard to a number of alternative projects, timings and market development scenarios."*

A proposed augmentation must pass the regulatory test irrespective of whether it is a transmission option or a non-transmission solution. This requires public consultation including appropriate disclosure of project costs.

If a non-transmission option is selected then it will be necessary for ElectraNet SA and/or ETSA Utilities to enter into a grid support contract with the successful market network service provider, generator, retailer or customer (in the case of load shedding or demand side management) for the provision of the required grid support services.

7.4.1 *Request for Proposals*

In addition to undertaking the Regulatory Test, specific requirements apply to the evaluation of an RFP. Where an RFP has been issued and/or where alternatives to an RFP are proposed, all conforming Proposals and options will be evaluated by ETSA Utilities. Conforming options developed by ETSA Utilities will also be evaluated at this time. Proposals are specifically being requested for Items 2, 3, and 4 detailed in Section 5 of this document.

ETSA Utilities may seek clarification of details from the proponent of a proposed option provided this does not materially alter the Proposal.

ETSA Utilities' evaluation of the options will include the following:

- Options (and where necessary groups of options) will be evaluated and ranked on the basis of the 'total net annualised costs of system support incurred by ETSA Utilities', plus the cost or benefits of changes to transmission and distribution losses. "Total net annualised costs of system support incurred by ETSA Utilities" includes all capital, fixed, variable and operating costs of securing the specified level of system support.
- System support will be measured in terms of kV.A of constrained peak capacity, $/kV.A of constrained peak capacity and the period of constraint.
- A ten-year period for evaluation will be used in this particular case.
- External costs should be included in the evaluation of any option wherever these reflect an existing or anticipated regulatory obligation of ETSA Utilities, as specified by the ACCC's Regulatory Test.
- The relative intrinsic risks, including the likely impact on system reliability and quality of supply, of specific options and technologies will be assessed in accordance with normal commercial practice.

In addition to evaluating proposals or options separately, ETSA Utilities may combine separate proposals or options for the purposes of evaluation where this may lead to a more efficient outcome than the separate proposal or option. Proponents should indicate in their Proposal whether they wish to have their proposals or options considered in combination with other proposals.

ETSA Utilities will publicly announce the outcomes of the RFP Evaluation Process. This announcement will include the total annualised cost to ETSA Utilities of the recommended option(s). All details of Proposals including cost information will be treated as public information unless clearly noted otherwise in writing by the proponent.

The announcement of the outcomes will be released no later than 13 weeks after the closing date for submissions.

8.0 Request for Information / Request for Proposals

ElectraNet SA and ETSA Utilities invite submissions and comments in response to this discussion paper from National Electricity Market participants, solution providers, and any other interested parties.

Submissions should be presented in a written form and contain at a minimum the information listed in section 7.3 including contact details for subsequent follow-up if required. If parties prefer, they may request to meet with ElectraNet SA and/or ETSA Utilities prior to providing a written response.

Proposals and submissions are specifically being sought for Items 1, 2, 3 and 4 detailed in section 5 of this document.

8.1 Submissions from Solution Providers

This is not a tender process – submissions are requested so that ElectraNet SA and ETSA Utilities can fulfil their regulatory obligations to compare the net present value cost of alternatives to the option of augmenting the transmission or distribution supply systems to maintain supply reliability.

As the submissions may be made public, any commercially sensitive material, or material that the party making the submission does not want to be made public, should be clearly identified. It should be noted that ElectraNet SA is required to publish the outcomes of the Regulatory Test analysis. ElectraNet SA and ETSA Utilities have obligations to undertake the Regulatory Test in a thorough and justifiable manner. If ElectraNet SA and ETSA Utilities are unable to undertake the Regulatory Test for a particular Proposal due to insufficient information provided by the proponent (including specific project cost data which may be withheld for commercial-in-confidence reasons), then the Proposal will by necessity be discarded.

8.2 Timetable for Submissions

The closing date for submissions to this RFI/RFP is 26 May 2004 for Item 1 and 1 October 2004 for Item 2, 3 and 4.

Requests for additional information or clarification regarding this RFI/RFP should be directed to:

Organisation	ElectraNet SA	ETSA Utilities:
Name	Hugh Westphalen	
Title	Network Customer Manager,	
Postal	ElectraNet SA, PO Box 7096 Hutt Street Post Office, Adelaide, South Australia, 5000	**Final Proposal:** ETSA Utilities Tender Box No: 1 1 Anzac Highway Keswick South Australia 5035
Email	*Westphalen.Hugh@electranet.com.au*	**Draft Proposal, or Requests for additional information:** *requestforproposals@etsautilities.com.au*
Telephone	(08) 8404 7221	
Facsimile	(08) 8404 7447	

8.3 Assessment and Decision Process

Item 1 – 275 kV Transmission capacity to supply the Southern Suburbs

ElectraNet SA intends to carry out the following process to assess what action, if any, should be taken to address the identified network limitations relating to Item 1:

Part 1	Initial Information Request (this paper) Submissions (response to this paper)	Issued 7 April 2004 Due by 26 May 2004
Part 2	Review and analysis. Likely to involve further consultation with Code participants and interested parties. Additional data may be requested to allow ElectraNet SA to carry out the economic assessment process as required by the National Electricity Code and the ACCC Regulatory Test.	July 2004 - September 2004
Part 3	Presentation of Application Notice containing recommendation of solution that satisfies the Regulatory Test.	October 2004
Part 4	Submissions on Application Notice.	November 2004
Part 5	Presentation of Final Report and recommendation.	December 2004
ElectraNet SA reserves the right to amend the timetable at any time. Amendments to the timetable will be made available on the ElectraNet SA website (http://www.electranet.com.au/)		

The above timetable is of an indicative nature only, however, this consultation is driven by the need to make a decision as soon as possible if any option involving significant construction is to be in place by the summer of 2005/06. At the conclusion of the above process, ElectraNet SA intends to take immediate steps to implement the recommended solution to ensure that the reliability of the system can be maintained. For example, if the preferred solution is a network augmentation, it is anticipated that construction will begin by January 2005.

Item 2, 3 and 4 – Southern Suburbs Connection Point Limitations/ Southern Suburbs 66 kV Projected Limitations – Northern System

Items 2, 3 and 4 will be subject to evaluation under ESCOSA Guideline 12 as well as the NEC and the expected time frame for this is as follows,

Milestone	Date
Public notification of outcomes of Reasonableness Test and Issue of RFP	7 April 2004
Receipt of Draft Submissions from Interested Parties (Optional)	9 July 2004
Response to Draft Submissions	20 August 2004
Final Submissions Received	1 October 2004
Evaluation of Submissions completed and Evaluation Outcomes published and provided to Interested Parties	7 January 2005
Investment Decision made by ETSA Utilities	23 March 2005
Possible Implementation Date	2006

Whilst ETSA Utilities and ElectraNet SA will endeavour to work within the above time frames, circumstances beyond the reasonable control of ETSA Utilities and ElectraNet SA may alter these time frames. ETSA Utilities and ElectraNet SA will advise interested parties of any significant alteration should this occur.