Request for Information –

Emerging Transmission Network Limitations

Darling Downs Area

(including the Granite Belt and Lockyer Valley)

Powerlink Queensland
17 June 2002

1.0 Introduction

This document seeks information on potential solutions to emerging limitations in the electricity transmission network supplying the Darling Downs and surrounding areas of the Granite Belt and Lockyer Valley. Corrective action is required if reliable supply is to be maintained during credible contingencies. This paper is an integral part of Powerlink's approach to meeting National Electricity Code requirements that ensure adoption of the most cost-effective solution to future network limitations.

1.1 Purpose of the Discussion Paper

The purpose of this discussion paper is to:

- provide information about the existing transmission network in the relevant area
- provide information about emerging network limitations and the expected time at which action must be taken to maintain system reliability during contingencies
- seek information on solutions to the emerging limitations which may be able to be provided by solution providers other than Powerlink
- explain the process to be used to evaluate alternative solutions

1.2 Discussion Paper Context

Powerlink Queensland has a responsibility to ensure its network is operated with sufficient capacity to provide network services to customers[1]. If technical limits of its transmission system will be exceeded, Powerlink is required to notify Code Participants within the time required for corrective action. Prior to construction of any major network augmentation to maintain reliability of supply, Powerlink must also meet the following regulatory requirements[2]:

- consult with Code Participants and interested parties regarding alternative solutions, including those which may be provided by solution providers other than Powerlink. These may include local generation, demand side initiatives, interconnectors and options involving other networks including market network services.

- demonstrate proper consideration of various market development scenarios, including variations in electricity demand growth rates, and the ability of reasonable options to satisfy emerging network limitations under these scenarios.

- ensure that the recommended solution meets reliability requirements at the lowest total net present value cost when compared with other feasible solutions.

This discussion paper is a critical step in fulfilling these regulatory obligations in relation to supply to the Darling Downs area.

[1] Powerlink's transmission authority includes a responsibility "to ensure as far as technically and economically practicable, that the transmission grid is operated with enough capacity (and if necessary, augmented or extended to provide enough capacity) to provide network services to persons authorised to connect to the grid or take electricity from the grid." (Electricity Act 1994, S34.2).

[2] As set by the ACCC and contained in Chapter 5 of the National Electricity Code

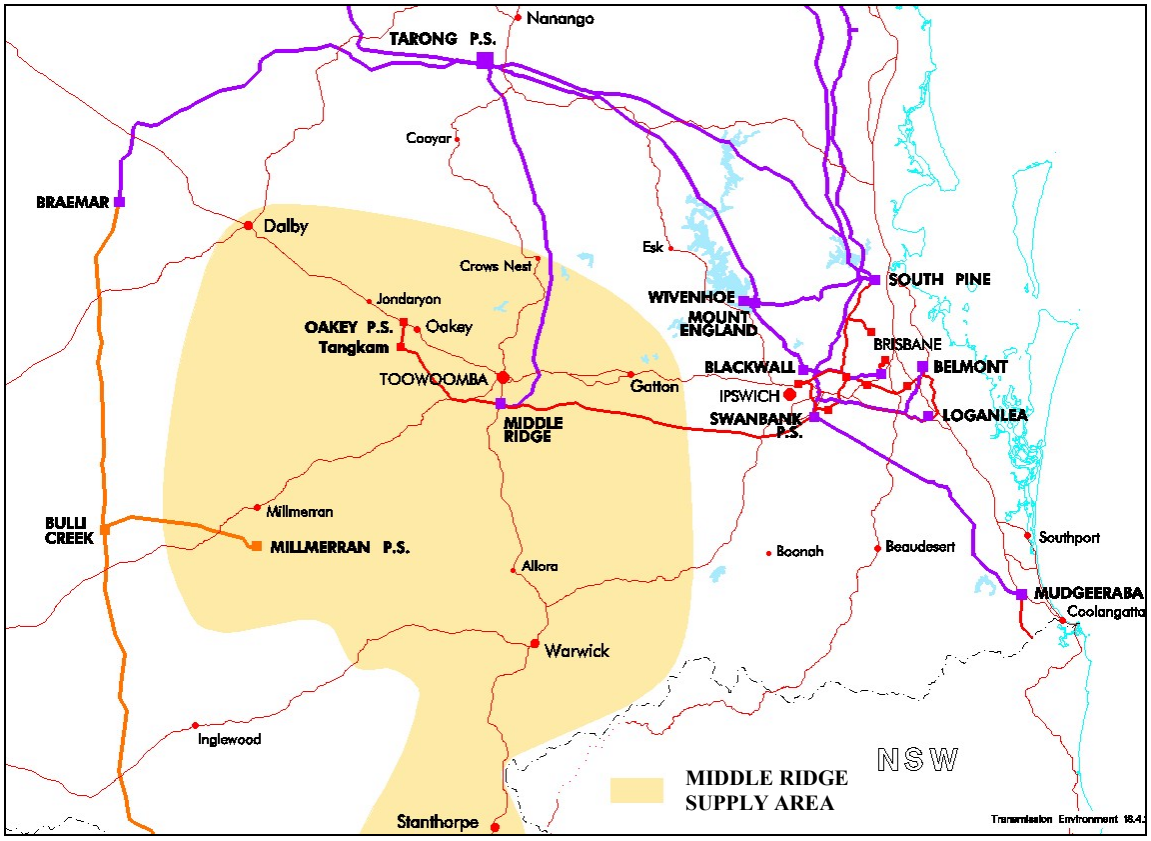
2.0 Existing Supply System to the Darling Downs and Surrounding Areas

2.1 Geographic Region

The relevant area is bounded approximately as follows:

- to the north by Lake Perseverance and the town of Crow's Nest.
- to the west by Dalby and the Country Energy electricity franchise area
- to the south by the town of Stanthorpe, and
- to the east by the Upper Lockyer Valley (see map below).

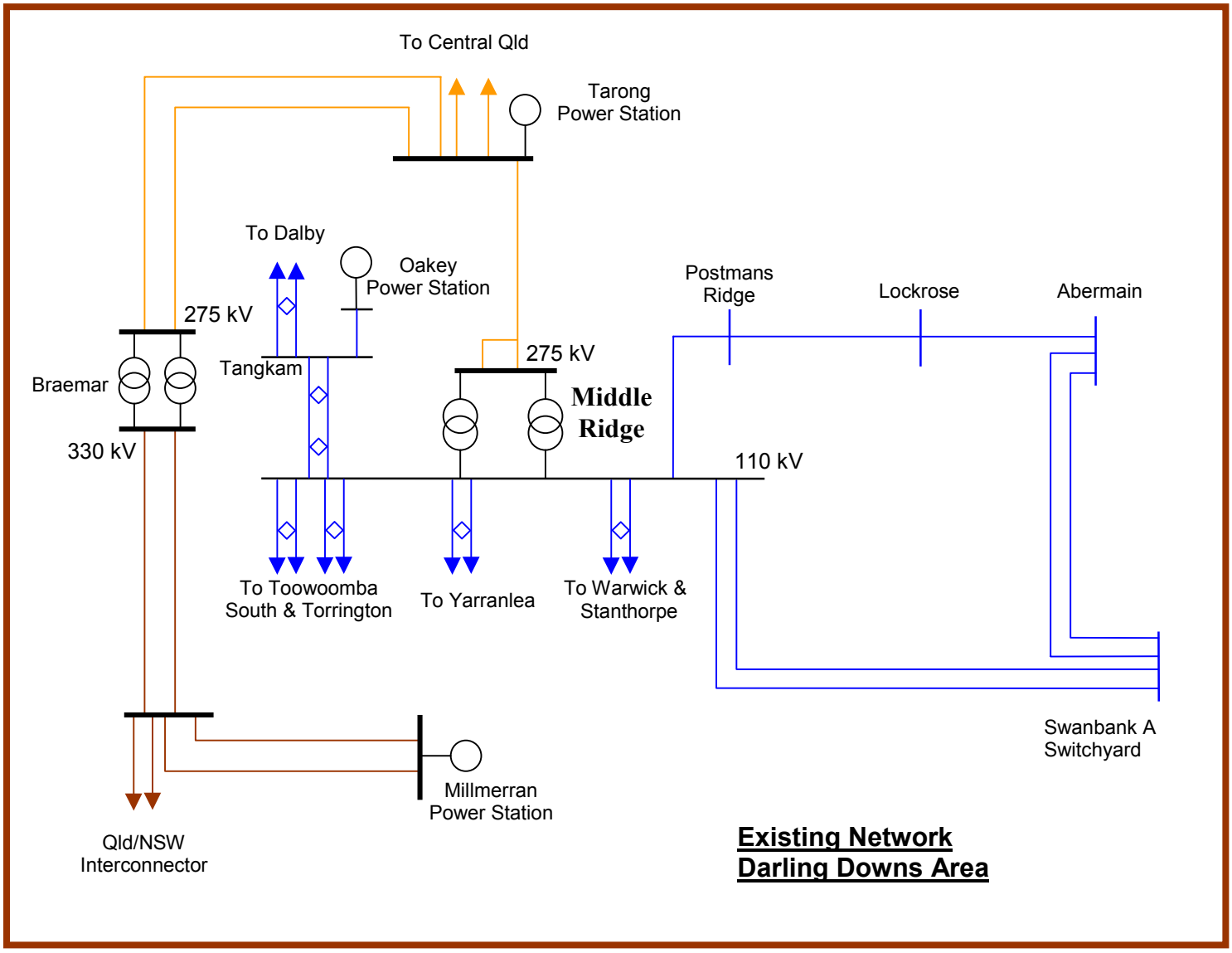
This area incorporates the major Darling Downs city of Toowoomba, the towns of Warwick and Stanthorpe to the south, Dalby and Millmerran to the west and the Lockyer Valley centred on the town of Gatton to the east.



2.2 Existing Network Supply System

Primary electricity supply to the Darling Downs region is via a single circuit 275kV transmission line between the substation near Tarong Power Station and Powerlink's Middle Ridge 275/110kV substation in Toowoomba.

During typical conditions[3], this line supplies all of the electricity used in the Darling Downs area, as well as contributing to power supply in the Greater Brisbane region. Power usually flows from Tarong to Middle Ridge, and is then transferred into the Energex and Ergon distribution networks as follows (see network diagram below):



[3] All elements of the transmission network in service and typical historical power station operation

- The Toowoomba area is supplied from the 275/110kV Middle Ridge substation via short connections to the Toowoomba South and Torrington 110/33kV substations. Customers in the Millmerran, Warwick and Stanthorpe areas are supplied by two 110kV single circuit radial lines from Middle Ridge. Middle Ridge also supplies the Dalby area via a 110kV connection to Dalby via Tangkam. There is a connection from Dalby to the western Queensland system at Chinchilla and Roma. However, due to line rating limitations, this connection is normally 'open' (ie - Chinchilla and Roma are not normally supplied from Middle Ridge via Dalby).

- Customers in south-east Queensland receive a small part of their supply via three 110kV circuits between Middle Ridge and Swanbank A near Ipswich. Two circuits run directly from Middle Ridge to Swanbank A, while the other circuit goes via the Lockyer Valley and Abermain (supplying customer load at 110/33 kV substations at Postmans Ridge and Lockrose).

- Typically, flow on the three circuits between Middle Ridge and Swanbank A is in the direction of Swanbank, injecting power into the Ipswich/Brisbane area. However, power will flow in the other direction towards Middle Ridge, if the single 275kV supply to Middle Ridge is out of service and back-up supply to the Darling Downs area is required.

Further information on the capability during contingencies is provided in section 6.0.

2.2.1. Technical Information

Ratings of equipment relevant to supply of energy to Middle Ridge substation:

Powerlink 275kV & 110kV Assets	Summer Normal (MVA)	Summer Emergency (MVA)	Winter Normal (MVA)	Winter Emergency (MVA)
Tarong-Middle Ridge Single Circuit 275 kV	515	699	694	898
Swanbank –Middle Ridge Double Circuit 110kV (rating applies to each circuit)	108	148	157	201
Middle Ridge – Tangkam Double Circuit 110kV (rating applies to each circuit)	222	307	255	332
ENERGEX 110kV Assets	Summer Normal (MVA)	Summer Emergency (MVA)	Winter Normal (MVA)	Winter Emergency (MVA)
Abermain – Lockrose 110kV	78	94	117	150
Lockrose – Postmans Ridge 110kV	84	102	131	165
Postmans Ridge – Middle Ridge 110kV	84	102	131	165
Swanbank – Abermain Double Circuit 110kV (rating applies to each circuit)	114	150	162	201

Powerlink Substations	Transformer No.
Middle Ridge 275/110 kV	2x200 MVA

Two 50MVAr 110kV shunt capacitor banks are located at Middle Ridge to assist in voltage support of the transmission system in the Darling Downs area[4].

2.3 Future Network Development

A project is underway to replace the 100MVA 275/110kV Swanbank bus tie transformers with 200MVA units. This will increase the injection strength of the 110kV circuits between Swanbank and Middle Ridge during contingencies on the 275kV feeder between Tarong and Middle Ridge. This work is due for completion in mid 2002.

A minor upgrade of the Middle Ridge 275/110kV transformers is being carried out by the end of 2002, and a 50MVAr capacitor bank to assist with voltage stability issues in the Darling Downs area is planned for commissioning in May 2003. This capacitor bank will be located at Powerlink's Abermain substation to the north of Ipswich.

Ergon intends to install a second 110/33kV 80MVA transformer at its Torrington substation in March 2003.

The increased capability from all of these projects was considered in the planning studies which have identified emerging network limitations in the Darling Downs supply system. There are no other committed upgrades to the transmission or sub-transmission networks supplying the Darling Downs area.

2.4 Existing and Committed Generation

A gas turbine power station is situated at Oakey and injects into the Middle Ridge to Dalby 110kV double circuit line at Tangkam switching station. The Oakey power station is privately owned, and is bid into the electricity market by Enertrade. It consists of two gas turbine units with a total capacity of 344/320MW (winter/summer). This power station operates mainly during peak periods, with the generators able to be started quickly (fully operational in 10 minutes). However, the units do not have the capability to be 'black-started' if all power supply to the area is lost.

Powerlink is not aware of any committed generation proposals in the target area.

Although outside the target area, Powerlink advises interested parties that CS Energy announced modernisation plans for its Swanbank power station site in March 2002. The plans include refurbishment and upgrade of the 4x125MW Swanbank B generating station, and phasing the 35-year-old Swanbank A generating units out of production by the end of June 2002. The new 385MW Swanbank E gas-fired generator commenced operational testing in May 2002. CS Energy recently decommissioned a small (52/44MW winter/summer) aged gas turbine unit at Middle Ridge.

[4] Installed in April 2002.

3.0 Load Characteristics

3.1 Overview

The Darling Downs, Granite Belt and Lockyer Valley Regions represent about two-thirds of total electricity demand in South West Queensland. The area incorporates significant rural and associated industrial load, as well as business and residential customers in the regional city of Toowoomba and other towns in the area.

3.2 Load Growth Overview

Electricity demand in South West Queensland as a whole is currently growing at approximately 3.8% per annum.

Demand in the Darling Downs, Granite Belt and Lockyer Valley target area (as defined in section 2.1) has grown at approximately 4.75% p.a. over the past six years. Electricity demand growth in the area is anticipated to continue at a relatively high rate of growth in the next five years as outlined in the following table:

Table 1: Darling Downs, Granite Belt and Lockyer Valley Demand Forecasts

Darling Downs, Granite Belt and Lockyer Valley Area Peak Demand (MW) [5]		
Year (summer – winter)	*Summer*	*Winter*
2001/02 – 2002	260	289
2002/03 – 2003	271	311
2003/04 – 2004	281	321
2004/05 – 2005	292	332
2005/06 – 2006	304	344

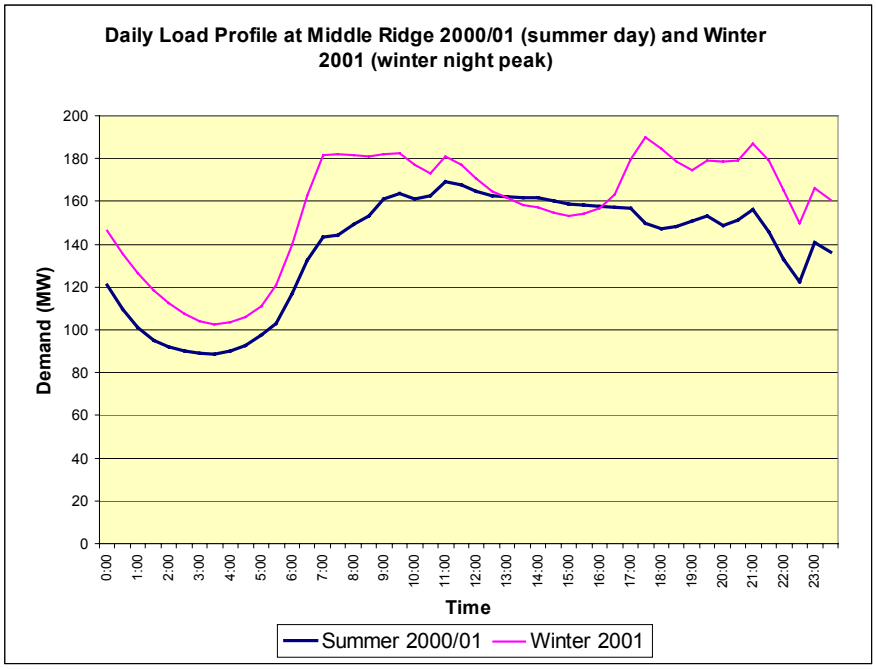
Powerlink obtains electricity demand forecasts over a ten-year horizon from Distribution Network Service Providers and customers at each connection point in Powerlink's transmission system. These forecasts thus take account of demand management programs in place or foreseen by distributors, and also the presence of embedded generation which may reduce the forecast of demand which needs to be supplied via each transmission connection point.

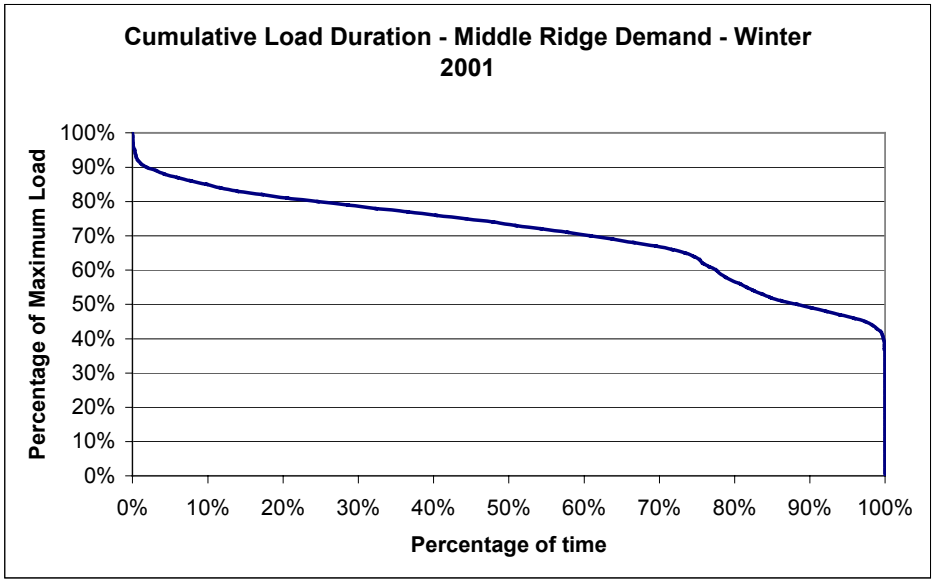
Forecasts in this section were obtained by aligning the local Ergon and Energex forecasts with an independent assessment of energy and demand forecasts for the Queensland region carried out by the National Institute of Economic and Industrial Research (NIEIR). This independent assessment included a review of the impact of potential future embedded generation.

[5] Forecast area demand supplied from Middle Ridge 275/110kV substation based on medium economic growth forecast and typical weather (ie: 50% probability of exceedance forecast). Includes Ergon loads at Middle Ridge, Tangkam and Postman's Ridge, and Energex loads at Postman's Ridge and Lockrose 110kV substations. Note that flow through the Middle Ridge 275/110kV substation transformers may be up to 30MW higher than the local area power demand under normal conditions due to connection with the Brisbane area via the lines to Swanbank and Abermain.

3.3 Pattern of Use

In contrast to most areas in Queensland, peak electricity demand in south-west Queensland occurs during the winter months from May to August. The pattern of electricity usage in winter shows a morning and evening peak each lasting for three to four hours, with demand dropping off during the warmer part of the day.





4.0 Transmission Planning Criteria

As a transmission network service provider (TNSP), Powerlink 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 must be met. This schedule requires that the transmission network be planned so that:

- the power frequency voltage is maintained within limits outlined in S5.1.4;
- voltage fluctuations do not exceed limits set out in S5.1.5;
- harmonic voltage distortion does not exceed limits set out in S5.1.6;
- voltage unbalance does not exceed limits set out in S5.1.7;
- the power system can operate in a stable state as defined in S5.1.8;
- faults can be cleared in times specified in S5.1.9;
- current rating of equipment is not exceeded as described in S5.1.12.

Schedule 5.1 also includes details of credible contingencies and levels of redundancy to be considered in planning and operating the transmission network.

Examples of differing levels of redundancy include:

- '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, and
- 'System Normal': the absolute minimum level of reliability required. Defined as the ability to supply all load with all elements of the electricity system intact (ie – loss of supply would occur during a single fault or contingency).

Consistent with the National Electricity Code and its transmission licence requirements, Powerlink plans future network augmentations such that the reliability and power quality standards of Schedule 5.1 can be met under conditions of 'N-1', unless otherwise agreed with affected participants.

The assessment of emerging network limitations in section 6.0 therefore covers the capability of the existing network to maintain supply during the loss of any single transmission element (ie: N-1 criterion). The most critical element in supply to the Darling Downs area is the 275kV supply feeder between Tarong and Middle Ridge.

5.0 Background – Network Capability

There are a range of technical factors which influence transmission network capability. Most important in relation to the network supplying the Darling Downs area are voltage control and thermal ratings of equipment.

5.1 Voltage Control

It is important for the quality of electricity supply to customers and the integrity of the total power system to maintain satisfactory voltage levels.

A fault or contingency can cause system voltages to fall rapidly. This is because a network fault causes increased power flows on the remaining equipment in service (ie- higher electrical current). Voltage drop is directly related to power flow, meaning that higher power flows following a fault or contingency result in a drop in voltage in the areas being supplied.

Unacceptably low voltage profiles can lead to collapse of the power system and widespread uncontrolled loadshedding as the problem 'cascades' to other elements of the network. Other consequences of low voltages may include 'brown-outs', failure of and/or damage to customer equipment such as motors etc.

Following a contingency, voltage can be improved after some tens of seconds through automatic adjustments to transformer operation (tapchanging). To a limited extent, system voltages can also be managed through the installation of voltage regulation equipment in the network (eg – capacitor banks, static var compensators etc).

Other factors that influence voltage control include the type of power use (eg – air conditioning load requires more voltage support), the amount of local power generation and the number of generating units which are operating. If local generators are operating and are able to provide sufficient voltage support[6] when a contingency occurs, the impact of a network outage on voltages is reduced.

5.2 Thermal Ratings

During the loss of items of transmission plant due to a fault or other contingency, the remaining elements of the transmission system must be able to carry the total load to avoid loadshedding. It is important to ensure that the technical capability of the remaining equipment will not be exceeded under these conditions.

The thermal ratings of lines and other equipment refer to the safe maximum current carrying capacity. For lines, these ratings are set at a level to avoid breaching statutory ground clearances. Ratings may be safely exceeded for very short periods, but extended operation above plant ratings will cause line conductors to sag below safe levels and/or items of equipment to burn out. Powerlink's licence requires it to protect its transmission grid to ensure the safe transmission of electricity. Loadshedding may be required to avoid exceeding thermal ratings.

[6] ie - supplying reactive power (MVArs)

6.0 Emerging Network Limitations

6.1 Overview

Powerlink's transmission grid supplying the Darling Downs is capable of supplying all of the area's power needs under normal conditions. However, analysis by Powerlink has determined that, during a network outage and without corrective action, a reliable power supply may not be able to be maintained from the summer of 2004/05 onwards.

As electricity demand grows, a point will be reached where the existing network will be unable to supply the peak customer load during a single contingency on the 275kV line supplying the area. The capability to supply peak load in the Darling Downs area is primarily limited by:

- low voltage levels during a single 275kV contingency
- overloads (exceeding thermal line ratings) of remaining lines during a single 275kV contingency

6.2 Under Voltage Limitations in the Darling Downs Area

For supply to the Darling Downs region, the critical contingency is an outage of the Tarong to Middle Ridge 275 kV line. Outage of this circuit requires the 110 kV circuits from Swanbank A to Middle Ridge to supply the entire area.

Detailed investigations have determined that, notwithstanding available subtransmission support, the capability of the existing network will be exceeded during a single contingency by the summer of 2004/05. During a single contingency and under assumed generation dispatch conditions[8], the voltage level of the entire area will become unacceptably low.

Without corrective action, customer loadshedding will be required during single contingencies from late 2004 onwards (in both summer and winter peak periods) in order to prevent voltage collapse and allow safe operation of the system.

Studies show that, for an outage of the 275kV Tarong-Middle Ridge circuit during the peak summer period in 2004/05, load shedding of up to 9% of the peak demand (about 20MW) would be required to maintain satisfactory voltage levels throughout the region. Depending on electricity demand and generation dispatch at the time, this disconnection may, in the worst case, result in total loss of supply to the radially supplied areas of Warwick, Stanthorpe and Yarranlea and some loss of supply to Toowoomba.

[8] For the purposes of this document, a generation dispatch pattern was assumed with two units at Swanbank B operational and other SE Qld generators at zero output. Note that the limitations identified are not sensitive to generation output at any SE Qld generator (including the new Swanbank E generator) with the exception of Oakey power station (see discussion section 7.2).

This analysis indicates that reinforcement of supply to the Darling Downs area is required by late 2004 to overcome voltage control limitations and loadshedding. This conclusion takes into account the recent and planned installation of capacitor banks in the area.

6.3 Line Rating Limitations in the Darling Downs Area

If a contingency occurs on the 275kV Tarong-Middle Ridge line, back-up supply to the Darling Downs area is provided by the 110kV lines from Swanbank.

Under these conditions, flow on the Energex 110kV circuit between Abermain and Lockrose will exceed thermal line ratings by the summer of 2003/04. The risk of overloading this line is small in the first year (at risk for approximately 1% of the time) and will be managed using operational measures[9].

However, measures to address the Abermain-Lockrose overloading during a 275kV network contingency cause higher flows on the other 110kV circuits from Swanbank-Middle Ridge. From 2004/05, such flows will exceed the thermal ratings of these lines, and customer loadshedding will be necessary to ensure that the electricity system in the area can be operated safely. Load shedding of approximately 30 MW would be required to reduce loadings below emergency ratings. Without corrective action, it is anticipated that the system would be at risk of loadshedding for approximately 16% of the peak summer period during 2004/05.

This analysis indicates that reinforcement of supply to the Darling Downs area is required prior to the summer of 2004/05 to avoid unacceptable line overloads during a 275kV network contingency.

[9] Opening the Lockrose to Postmans Ridge circuit alleviates overload on the Abermain to Lockrose line.

7.0 Factors Impacting Timing of Required Corrective Action

7.1 Assumed Electricity Demand

Section 6.1 identified that, without corrective action, the existing system will be unable to maintain supply during single contingencies by late 2004.

The primary driver of this emerging network limitation is the forecast growth in electricity demand in the area. The 2004 timing conclusion was based on a load growth forecast that assumed typical temperatures and medium economic growth. Changes to this assumption can alter the required timing for corrective action as follows:

Very Hot or Cold Conditions: If one in ten year extreme temperatures coincide with a single contingency during the summer of 2003/04 or the winter of 2004 (a very low probability), system capability would be exceeded. In this situation, loadshedding may need to occur to avoid exceeding thermal line ratings or to manage voltage levels.

Mild Weather Conditions: Milder summer and winter temperatures reduce the forecast demands on the transmission grid. If mild conditions occur, network voltages could be maintained during a contingency for one additional year (ie – until summer 2005/06). However, even with lower forecast loads, thermal ratings of the relevant 110kV lines would still be exceeded in the summer of 2004/05 during a single contingency. Therefore, if mild summer and winter temperatures are assumed, action is still required prior to the summer of 2004/05 to prevent customer loadshedding during a single 275kV contingency.

7.2 Assumed Generation Pattern

As noted in section 6.1, Powerlink has determined that network limitations will arise in the Darling Downs area in late 2004 based on an assumed generation pattern. The network planning studies assumed a dispatch pattern which included two generating units at Swanbank B in operation and all other South East Queensland scheduled generating units[10] at zero output.

Should market conditions be favourable, power stations at Oakey, Wivenhoe and other units at Swanbank[11] may be operating at the time of a single 275kV contingency. This could have the following impact on the emerging network limitations:

- Wivenhoe and Swanbank B power station units (and the new Swanbank E station) provide minimal voltage support to Middle Ridge, because they do not inject directly into the Darling Downs system at the appropriate voltage. They also do not contribute to reducing the flow on the Abermain-Lockrose line which overloads during a 275kV network contingency. The emerging network limitations are therefore insensitive to operation of generators at Swanbank and Wivenhoe.

[10] Scheduled generators are those dispatched via the National Electricity Market dispatch mechanisms.
[11] Note that Swanbank A has been excluded from the assessment of future capability following the announcement by CS Energy that these generating units will be phased out of production in mid 2002.

- Oakey Power Station has a 110kV connection to Middle Ridge, and is also located in the target Darling Downs area. Generation at Oakey would provide voltage support, and would also reduce the power needing to be transferred to the Darling Downs area via the 110kV transmission lines from Swanbank A following loss of the Tarong - Middle Ridge 275kV feeder. Generation at Oakey may therefore overcome both the voltage issues and the thermal limitations on the 110kV system, but only if the station is operating at the time of a 275kV contingency.

The Oakey power station is a 'peak' generator which usually only operates at times of high wholesale electricity prices. If the generator is not operating during a network contingency, reliability of supply to the Darling Downs would be impacted. A grid support service from the Oakey generator may be a feasible partial or total solution. This is discussed further in section 8.0.

7.3 Other Factors

Augmentations to the distribution network may influence the flows on the 275kV and 110kV system in the relevant area. Powerlink has held discussions with Energex and Ergon and established that there are no distribution augmentations likely to be committed in the near future that would impact the required timing for action to address the emerging transmission network limitations.

There are no other factors, given the existing electricity supply system and committed augmentations, which have been identified to influence the timing of emerging network limitations in the Darling Downs area.

7.4 Conclusion

It is Powerlink's conclusion that the existing electricity system supplying the Darling Downs must be augmented before October 2004 if supply reliability is to be maintained during a single contingency.

Historically, the forced outage rate of the 275kV feeder between Tarong and Middle Ridge has been extremely low. Nevertheless, an outage of this feeder during the peak summer period from 2004/05 onwards will require customer load shedding. Also, because of the impact an outage of the feeder has on supply to the area, maintenance times for the feeder will be very restricted.

Given Powerlink's obligations outlined in earlier sections of this report, and advice from Ergon that customer loadshedding in the area following a 275kV contingency is unacceptable, it is considered that the system supplying the Darling Downs should be augmented by October 2004 at the latest.

8.0 Assessment of Alternative Solutions

As outlined in section 6.0, it is essential that action be taken prior to the summer of 2004/05 to maintain a reliable electricity supply to the Darling Downs area. This action may involve network augmentation, or the implementation of local generation and demand side management (DSM) options which reduce, defer or eliminate the need for new network investment.

8.1 Identifying Solutions

In May 2001, Powerlink published its 2001 Annual Planning Report. This report advised of emerging network limitations in the South West Queensland area. Powerlink has received no information regarding proposals to address these emerging limitations from prospective solution providers in the normal course of business or in response to its Annual Planning Report.

This discussion paper, and subsequent consultation, provides a further opportunity for alternative solution providers to submit details of their proposals for consideration. The information provided in this document on emerging network limitations in the Darling Downs area is intended to enable interested parties to formulate and propose feasible and definitive local generation, network and demand side management solutions.

8.2 Criteria for Solutions

To assist solution providers understand the technical and other requirements, Powerlink has identified the following criteria which must be satisfied if solutions are to meet the underlying need for augmentation of supply to the Darling Downs area:

Size: Feasible options must be large enough, individually or collectively, to overcome the identified voltage and thermal limitations. In 2004/05, this may require 20-50MW of capacity to be supplied by alternative means (eg – a local generator, DSM program etc). The capacity required depends on the interaction between the location of the generator or other solution and local voltage and load levels. In subsequent years, required capacity would increase by at least 10MW each year to keep pace with load growth, again dependent on the location of the option.

Time of Year: Options must, at a minimum, be capable of meeting demand during both peak summer and peak winter months. Satisfactory voltage levels will not be able to be maintained with the existing system during both summer and winter from late 2004 onwards. Thermal limitations on the 110kV network in the area are more of a summer issue. Options must be able to operate during both summer and winter peak periods to overcome these emerging network limitations.

Location: To be a viable ‘standalone’ non-transmission solution, an option must reduce the electricity that has to be transferred via the existing 110kV transmission system supplying the Darling Downs area during an outage of the Tarong-Middle Ridge 275kV line. This implies that any ‘standalone’

local generation option must be located so as to reduce the load at 110kV connection points supplied from Middle Ridge substation.

Operation: If it is recommended that a new local generation option is the most appropriate solution to the emerging reliability issues, this generator will be required to operate "on demand" at certain times to satisfy reliability criteria. Such operation will be required regardless of the pool price at the time (the National Electricity Code prevents a generator that is providing grid support from setting the market price).

Generation will need to be operational during all periods that the transmission system would not otherwise be able to supply load if a contingency occurred. That is, they must be operating "pre-contingency", when the transmission system is intact. Otherwise, loadshedding will occur immediately following a fault on the relevant 275kV feeder (loadshedding would be automatic and instantaneous following an outage of the 275kV feeder to prevent 'cascading' voltage collapse).

Demand side programs must either reduce load pre-contingency (ie – contain electricity demand to winter 2004 levels) or automatically disconnect sufficient customer supply immediately following a contingency. Proponents of the latter type of program are advised that the demand side response must be automatic and occur within 10-15 seconds to prevent voltage collapse. Therefore, any customers agreeing to participate in such a program would not be able to have any warning of the power interruption.

Timeframe: All options must be operational before October 2004. As outlined, the required timing for corrective action to address emerging network limitations is prior to the summer of 2004/05.

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 by end 2002 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 Darling Downs area – it is not considered appropriate to rely on uncommitted developments that may or may not proceed.

8.3 Assessment of Solutions

The ACCC's Regulatory Test and Chapter 5 of the National Electricity Code require Powerlink to consider local generation, DSM, inter-regional and network options on an equal footing.

The Regulatory Test also specifies the assessment methodology to be used:

"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."

An augmentation proposed to meet an objectively measurable service standard linked to the technical requirements of Schedule 5.1 of the Code, or other statutory requirements, is referred to as a 'reliability augmentation'.

Any regulated augmentation proposed as a consequence of addressing the emerging network limitation in supply to the Darling Downs area as outlined in this report will be a 'reliability augmentation' because:

- there is a clear need for the augmentation based on the limitations identified in this report
- the limitations are based on an objectively measurable service standard linked to the technical requirements of schedule 5.1 of the Code as set out in this report.

This means the assessment of solutions will be based on minimising the net present value of the cost of meeting the service standard.

A public process is required, with disclosure of project costs and comparison of alternatives. As the outcome of the economic analysis could be a recommendation to proceed with a regulated solution, it is important that all feasible options are considered in the process.

If a non-network option satisfies technical requirements, is committed and can be implemented for a lower cost than a transmission augmentation, it is likely to be necessary for Powerlink to enter into a network support contract with the proponents of the alternative project to ensure supply reliability can be maintained. If regulated funding is required from Powerlink, it is necessary that grid support arrangements satisfy the Regulatory Test in terms of both economics and disclosure of relevant costs to the market.

9.0 Request for Information

Powerlink invites 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 should clearly identify the proponent of the submission including contact details for subsequent follow-up if required. If parties prefer, they may request to meet with Powerlink ahead of providing a written response.

9.1 Submissions from Solution Providers

This is not a tender process – it is a request for information. Submissions are requested so that Powerlink can fulfil its regulatory obligations to compare the net present value cost of alternatives to the option of augmenting the transmission supply system to maintain supply reliability.

If your submission proposes a solution, it should contain the following information:

- Details of the party making the submission (or proposing the solution)
- Technical details of the project (capacity, proposed connection point if relevant etc) to allow an assessment of the likely impact on supply capability
- Sufficient information to allow the costs of the solution to be incorporated in a cost-effectiveness comparison in accordance with ACCC Regulatory Test guidelines.
- An assessment of the ability of the proposed solution to meet the technical requirements of the National Electricity Code
- Timing of the availability of the option, and whether it is a committed project
- Other material that would be relevant in the assessment of the proposed solution

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 Powerlink is required to publish the outcomes of the Regulatory Test analysis. If solution providers elect not to provide specific project cost data for commercial-in-confidence reasons, Powerlink may rely on cost estimates from independent specialist sources.

9.2 Timetable for Submissions

Please provide information by Friday 26th July to:

Alison Gray
Manager Network Assessments
Powerlink Queensland
PO Box 1193
Virginia QLD 4014
Agray@powerlink.qld.gov.au
Tel: (07) 3860 2300
Fax: (07) 3860 2388

9.3 Assessment and Decision Process

Powerlink intends to carry out the following process to assess what action, if any, should be taken to address the identified network limitations:

Part 1	Initial Information Request (this paper). Submissions (responses to this paper).	Mid June Late July
Part 2	Review and analysis. Likely to involve further consultation with Code participants and interested parties. Additional data may be requested to allow Powerlink to carry out the economic assessment process as required by the National Electricity Code and the ACCC Regulatory Test.	August to December
Part 3	Publication of application notice (draft report recommending the solution that satisfies the Regulatory Test) Submissions on application notice Presentation of final report and recommendation	End December Mid February 03 Early March 03
Powerlink Queensland reserves the right to amend the timetable at any time. Amendments to the timetable will be made available on the Powerlink website (www.powerlink.com.au)		

The consultation timetable is driven by the need to make a decision by early 2003 if any option involving significant construction is to be in place by the summer of 2004/05. At the conclusion of the process, Powerlink 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 need to begin in mid 2003.