Mr Sebastian Roberts
General Manager
Electricity Group
Regulatory Affairs Division
Australian Competition and Consumer Commission
GPO Box 520J
Melbourne VIC 3001

Dear Mr Roberts

Application for conversion of Directlink merchant interconnector

I am responding to your letter of 28 February.

As you are aware, the far north coast of NSW is supplied via a single 330 kV line from Armidale to Lismore (89 line) and an underlying 132 kV network. The most critical element in this network is 89 line. Should it be out of service at times of high area demand, the remaining 132 kV network faces two limitations; overloading of the 966 Armidale – Koolkhan 132 kV line in summer, and unacceptably low voltages in both summer and winter.

In the last two years, the summer demand for electricity on the far north coast has grown at a rate well above that forecast. During summer 2004/05, the maximum demand exceeded that forecast for summer 2006/07. Consequently the risk of load interruptions following a critical contingency is greater than previously anticipated and works to mitigate that risk are urgently required.

Powerlink, together with Energex, is in the process of augmenting the transmission capacity to and within the northern part of the Gold Coast with the intention of completing the necessary works by summer 2006/07. I understand from discussions with Powerlink that completing the works by summer 2006/07 is achievable but that they have experienced delays with new environmental approvals required by legislative changes. Any significant delays in completion would increase the risk to supply during summer 2006/07.

Works to reinforce supply to the southern part of the Gold Coast and the Tweed Shire are expected to be required. Joint investigations by Powerlink, TransGrid, Energex and Country Energy have been initiated. At this stage, it is expected that constraints within the network supplying the southern part of the Gold Coast and the Tweed Shire will limit the capability for Directlink to provide firm network support to the Lismore area, at times of high Gold Coast/ Tweed Shire demand, beyond summer 2006/07, until further major augmentations are completed. These matters have not been studied in detail and will be considered as part of future joint planning investigations for supply to the southern Gold Coast and Tweed areas and to the Lismore area.

Within New South Wales, the works, which can be practically completed before, summer 2006/07, are: uprating of 966 line and installation of capacitors at Koolkhan. Uprating of 966 line will relieve the limitation imposed by its summer day rating, and installation of capacitors at Koolkhan will reduce the risk of low voltages, as well as reducing the loading on the Koolkhan transformers. TransGrid intends to proceed with these works.

This summer (2004/05) high loads in northern New South Wales have coincided with high loads in southeast Queensland. The Queensland network has experienced loads approaching its N-1 capability, while the loading on the New South Wales network has exceeded its N-1 capability. The scope for Directlink to support the far north coast is limited by constraints in the network supplying the Gold Coast. As outlined in the "Final Report – Proposed New Large Network Asset – Gold Coast and Tweed Areas" dated 6 July 2004, Powerlink intends to utilise network support from Directlink during the 2005/06 summer.

Powerlink has advised that supply to the Gold Coast area is currently under review. This is part of the regular planning process whereby demand forecasts and the capability of the network to meet the forecast demand are reviewed annually.

Attached are the responses to the specific questions included in your letter. I trust that this is of assistance in your assessment of supply conditions in northern New South Wales. Please contact me on (02) 9284 3217 if you wish to discuss any of the information.

Yours sincerely

(Signed 11/03/05)

Mal Park
Executive Manager/Strategic Network Development

Attachment

Responses to specific questions included in ACCC letter dated 28 February 2005

Is 966 line currently at risk of being overloaded following an outage of 89 line?

At times of high summer demand there is a risk that 966 line may be overloaded. An initial assessment indicates that the risk existed for around 200 hours over summer 2004/05. The strategy to manage this situation is described below. This issue appears to have developed, in part, due to load growth being significantly higher than the Country Energy's load forecast for the area.

Is TransGrid currently reliant on Directlink to maintain its N-1 obligations?

There is presently a risk of load interruptions should a critical contingency occur at times of high load. This risk is exacerbated by loads in excess of those forecast. At present, limitations within the Queensland network supplying the Gold Coast mean that Directlink cannot be relied upon to support the New South Wales north coast at these times. Consequently, at this stage TransGrid cannot rely on support from Directlink at peak load times. Directlink may be able to provide network support to NSW at times when the Queensland load is lower than peak levels.

Do the power flow conditions of 20 February 2004 indicate that TransGrid is reliant on Directlink?

BRW's letter of 23 February 2005 makes a number of comments about load at risk, which is illustrated by reference to conditions on 20 February 2004 (one instance of high far north coast loads). It contemplates a situation where an outage of 89 line results in 966 line overloading and then being tripped by its protection, leading to voltage collapse. It then implies that Directlink is being relied upon to prevent such an occurrence.

Under conditions of high summer load, an outage of 89 line would result in the sustained emergency rating of 966 line (but not its short time rating) being exceeded and possibly also unacceptably low voltages in the area. In these circumstances, load-shedding schemes at Lismore and Koolkhan would either operate automatically in response to low voltages or be initiated by system operators within a short time bringing 966 back within its sustained emergency rating.

Supply to interrupted loads would then be restored as quickly as possible. This could be facilitated by favourable circumstances such as:

- prompt return of 89 line to service;
- a reduction in other loads in the area (as part of their normal daily load cycle), or
- the availability of alternative supplies such as from Directlink (should there be sufficient capacity in the Queensland system) or embedded generation (should that be developed). In the most favourable circumstances, in which alternative supplies are available pre-emptively, it may not be necessary to interrupt any load.

In short, the voltage collapse scenario contemplated by BRW should not arise from a single contingency, and restoration of interrupted load could be facilitated by a number of factors, including the possible availability of support from Directlink.

Does TransGrid consider that it is practical to rely on a coordinated voltage scheme involving Directlink to defer augmentations supporting the Port Macquarie area?

The Port Macquarie area is "electrically" quite remote from Lismore. TransGrid does not believe that it is practicable to rely on network support in the Lismore area, from Directlink, to defer works to augment supply capacity to the mid north coast (the Kempsey/Port Macquarie/Taree area) as:

- some of the works cannot be deferred by network support in the Lismore area;
- it is not certain that the necessary control scheme coordinating operation of Lismore and Coffs Harbour 330/132 kV substations can be practically implemented;
- it is likely that unexpectedly high load growth on the mid north coast will advance the date at which an augmentation is required, and
- the lead-time available to complete the works required to maintain reliability standards on the mid north coast is of concern.

These points are elaborated on below.

Some works cannot be deferred by support in the Lismore area

A component of the works on the mid north coast is the construction of a second line between Kempsey and the Port Macquarie area. This line is required to cater for an outage of the existing Kempsey – Port Macquarie 132 kV line. For this outage, there is no 132 kV connection north of Port Macquarie. Under this circumstance, Port Macquarie is then supplied from Newcastle. Network support to the north of Port Macquarie is of no benefit.

More generally, for outages of 132 kV lines supplying the mid north coast, support in the Lismore area is of no benefit.

Concern over the necessary control scheme

Coffs Harbour 330/132 kV substation, which will be "looped" into the present Armidale – Lismore 330 kV line, is expected to be completed by mid 2006. Following its commissioning, the most critical outage will become the Armidale – Coffs Harbour 330 kV line.

TransGrid is investigating a control scheme, which would coordinate operation of transformer tap changers and switching of reactive plant at the existing Lismore and future Coffs Harbour 330/132 kV substations. Such a control scheme would, if it is practical to implement, allow the Coffs Harbour – Lismore 330 kV line to remain in service if the Armidale – Coffs Harbour 330 kV line is out of service. This would, in turn, allow voltages on the mid north coast to be supported from Lismore.

At this stage it is not certain that the control scheme with acceptable reliability will be able to be practicably implemented and it would be unwise to assume that it can. If it cannot, the need to augment supply to the mid north coast is extremely pressing.

Unexpectedly high loads on the mid north coast

Demand on the mid north coast has also grown at a rate well above the forecast, in fact, the summer 2004/05 maximum demand exceeded the expected demand forecast for summer 2011/12. *(Graph of Actual Demand vs. Forecast Demand in attached)*

Country Energy develops load forecasts each year. Country Energy will undoubtedly review the actual 2004/05 loads as part of their forecasting processes and it is likely that forecasts of summer loads will increase. This would advance the time by which an augmentation of supply to the mid north coast is required.

Lead times

The works required to augment supply to the mid north coast are:

- Construction of a second circuit between Kempsey and Port Macquarie.

- Conversion of the circuit of the Coffs Harbour – Nambucca – Kempsey double circuit line, which presently operates at 66kV, to operate at 132 kV. This will provide two 132 kV circuits to Kempsey from the north, and is a prerequisite to allow the 965 Armidale – Kempsey 132 kV line to be taken out of service for reconstruction as a 330 kV line.

  The associated works include, establishment of 132 kV substations to replace some existing Country Energy 66 kV supplies, provision of a second 132/66 kV transformer at Nambucca, and stringing the second circuit of a section of the double circuit line near Kempsey.

- Reconstruction of the existing 965 Armidale – Kempsey 132 kV line as a 330 kV line. The duration of reconstruction will depend on the availability and extent of a new line route.

  If it is necessary to construct the 330 kV line on the centre line of the existing 132 kV line, extended outages of the existing line would be required (to dismantle it before building the new 330 kV line). This would only be possible over lower load periods in spring and autumn. If it is possible to obtain a new route for sections of the 330 kV line (and to later remove the existing line), then less extensive outages of the existing line would be required and a shorter time would be required to complete the 330 kV line.

  The availability and extent of any new line route would be determined during community consultation. At this stage, it would be unwise to rely on extensive sections of new route being available. Consequently, it is important that the works to provide a second 132kV circuit between Coffs Harbour and Kempsey and reconstruction of 965 line be initiated in an expeditious manner.

Does TransGrid intend to upgrade 966 line as part of its asset rehabilitation plans?

TransGrid intends to uprate 966 line to relieve one of the limitations within the network supplying the far north coast. In addition, it is anticipated that a small number of structures will be replaced as part of TransGrid's ongoing asset management strategies.

TransGrid's views on retention of N-1 supply for Tenterfield.

Reliability criteria are agreed as part of the joint planning process. An appropriate standard for Tenterfield (in the event that the existing Tenterfield – Lismore 132 kV line is rebuilt as a 330 kV line) has yet to be agreed with Country Energy. To incorporate community attitudes and other relevant factors, we would expect that this issue would be addressed much closer to the time at which the 132kV line may be rebuilt.

TransGrid recognises that the magnitude of the Tenterfield load (less than 10 MW) is presently considerably less than that at which a second 132kV supply would normally be provided. However, in light of generally increasing community expectations, a reduction in reliability from present levels may not be acceptable. TransGrid accepts that Country Energy, as our customer, is responsible in the final analysis to accept the level of reliability required. At Tenterfield, this may require the adoption of a suitable non-network/standby generation solution or partial network support at lower voltage.