

NEW SMALL TRANSMISSION NETWORK ASSET

UPRATING OF 966 ARMIDALE – KOOLKHAN 132 kV TRANSMISSION LINE

November 2005

New Small Transmission Network Asset Report

Upgrading of the 966 Armidale – Koolkhan 132 kV Line

1.0 Procedural Context

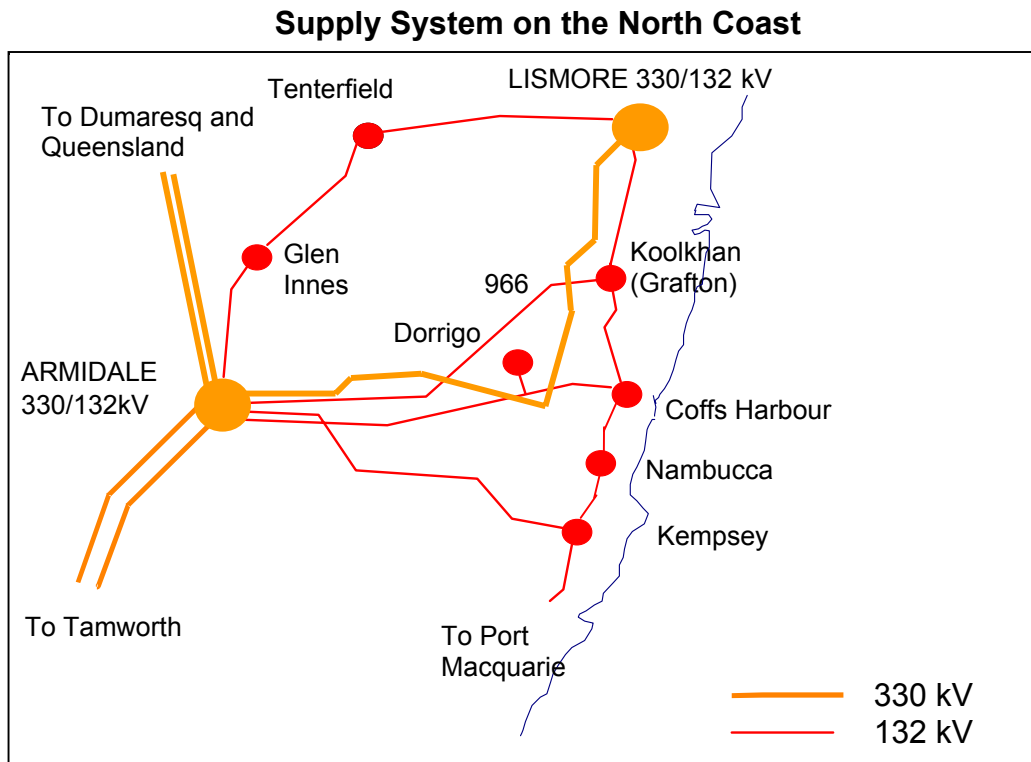
This report is being issued in accordance with clause 5.6.6A (c) of the National Electricity Rules. It covers upgrading of the existing 966 Armidale – Koolkhan 132 kV transmission line by the replacement of around 40 structures to increase conductor clearances. These works are expected to cost approximately \$5 million and to be completed by summer 2006/07.

This proposal was most recently described in (Item 6.4.3 of) TransGrid's 2005 Annual Planning Report (APR) as an option to relieve a constraint arising within a five year period. Since the APR was published, investigations have confirmed that the expected cost of the proposal is less than \$10 million and that the works therefore constitute a New Small Transmission Network Asset. As foreshadowed in the APR, this report covering a New Small Transmission Network Asset is now being issued.

The works are a reliability augmentation as they are required to relieve thermal overloading of 966 line on outage of the 89 Armidale – Lismore 330 kV line at times of high demand in summer.

2.0 Background

The far north coast is supplied by a single 330 kV line between Armidale and Lismore, together with an underlying 132 kV network. This system is shown in the figure below.



In 2000 Directlink (a high voltage direct current link between Mullumbimby and Terranora) commenced operation.

The 966 Armidale – Koolkhan 132 kV line is 177 kilometres long and has approximately 580 two and three pole “H” type structures. It was built in the early

New Small Transmission Network Asset Report

Uprating of the 966 Armidale – Koolkhan 132 kV Line

1960s and was the first 132 kV line in the area. It was originally designed for a maximum conductor operating temperature of 120 °F (49 °C) but was uprated in the early 1990s to 60 °C, primarily by the addition of “risers” to increase the height of some structures. To achieve the maximum conductor operating temperature now required (75 °C) it will be necessary to replace around 40 structures.

3.0 The Network Constraint

The capacity of the 132 kV system is presently limited by the thermal rating of the 966 Armidale – Koolkhan 132 kV line on outage of the 89 Armidale – Lismore 330 kV line at times of high demand in summer.

To relieve this limitation over summer 2005/06 a reduction of approximately 60 MW in the Lismore and Koolkhan (Grafton) area maximum demand would be required. Additional reductions of around 10 MW p.a. would be required thereafter.

4.0 Reliability Augmentation

Following changes, made by the Department of Utilities, Energy and Sustainability, to Country Energy’s licence conditions covering reliability levels for planning purposes, Country Energy has requested that TransGrid provide commensurate levels of reliability at its supply points. The required reliability standard is N-1 at all supply points having a maximum demand greater than 15 MVA.

The maximum demands at Lismore and Koolkhan supply points are presently around 163 MW (175 MVA) and 58 MW (66 MVA) respectively. Consequently, the requested reliability standard applies to these supply points. As the network constraint described in Section 3.0 relates to the inability to provide this standard of reliability, the proposed works are a reliability augmentation.

5.0 Options to Relieve the Constraint

The options to relieve the constraint which were considered are:

- Use of Directlink to provide network support;
- Construction of an additional 330 kV line, most probably from Dumaresq to Lismore;
- Construction of additional 132 kV lines;
- Demand management and/or local generation; and
- Uprating the 966 Armidale – Koolkhan 132 kV line.

These options are discussed in the following sections.

5.1 Network Support from Directlink

Directlink has the potential to supply some of the Lismore area load (by transmitting power from Queensland) which could relieve the network limitation. However, in the short to medium term the ability for Directlink to provide network support in this way is limited by the requirement for it to provide support to the Queensland network (transmit power to Queensland) at high load times and by limitations within the Queensland network. Consequently, network support from Directlink is not considered to be a feasible option.

New Small Transmission Network Asset Report

Upgrading of the 966 Armidale – Koolkhan 132 kV Line

5.2 Construction of an Additional 330 kV or 132 kV Line

This option would involve construction of a new line from a 330 kV substation (such as Armidale or Dumaresq) to Lismore or Koolkhan, a distance of around 200 kilometres. Such a line would be considerably more expensive than upgrading 966 line and would take a number of years to complete. Consequently this option is not considered to be reasonable for addressing this constraint.

5.3 Demand Management and Local Generation

Although limitations in the network supplying the far north coast have been published in Annual Planning Reports for a number of years and in a document titled “Emerging Transmission Network Limitations on the New South Wales Far North Coast”, published August 2003, no proponents of demand management projects have emerged. This outcome, together with the magnitude of demand reduction required, has lead TransGrid to conclude that demand management is not a feasible option.

Generation at sugar mills in the Lismore area has been proposed. As the development involves a single generating unit, at present the proponent is reluctant to enter into a network support agreement. Consequently network support from local generation is not considered to be a feasible option.

5.4 Upgrading of the 966 Armidale – Koolkhan 132 kV Line

Upgrading of 966 line is feasible. It is expected to cost approximately \$5 million and to be completed by summer 2006/07.

As this option is the only feasible and reasonable option to address this constraint, it is considered to satisfy the regulatory test.

6.0 Material Inter-network Impact

In the 2005 APR TransGrid stated that the proposed works may have a material inter-network impact, as they may impact the northward capability of Directlink in some circumstances. Since that time the constraint equations (used in NEMMCO's dispatch process) involving Directlink flows and the rating of 966 line have been reviewed. As a result, the rating of 966 line is no longer expected to materially impact on the northward capability of Directlink.

Consequently, the works are not expected to have a material inter-network impact.

7.0 The Proposed Reliability Augmentation

It is proposed to upgrade the 966 Armidale – Koolkhan 132 kV line at a cost of approximately \$5 million by summer 2006/07.

8.0 Making Submissions

Interested parties have 20 business days from the publication of this document to make written submissions on this proposal. The last day for submissions is 30 December 2005.

Submissions should be provided by email to:

regulatory.consultation@transgrid.com.au.