Appendix I

Dumaresq – Lismore Transmission Line Project - Circuit Breaker Arrangement

Background

International best practice is to adopt connection arrangements for lines major flow paths to be connected through multiple circuit breakers to provide operation flexibility and reliability. The multiple circuit breaker connection of lines is normally achieved using either breaker and half arrangement or double breaker arrangement. Breaker and half arrangements are recognised as the most cost effective connection arrangement.

Dumaresq 330 kV switching station was established in 2000 as part of QNI project which connected Queensland to the south east Australian Power System.

The Dumaresq switchyard is arranged to have circuit breakers in a breaker and half arrangement in accordance good electricity industry practice. However, the initial arrangement for Dumaresq 330 kV switching station does not require every circuit breaker in the breaker and half arrangement to be provided, and consequently Dumaresq presently has four circuit breakers installed forming a four breaker mesh. The arrangement is in accordance with good electricity practice and is shown below in figure 1.

NEMMCO is responsible for the ANTS and QNI is identified in the ANTS as major flow path. QNI has been the focus of proposals for augmentations, and assessments have been undertaken by Powerlink, TransGrid and NEMMCO.

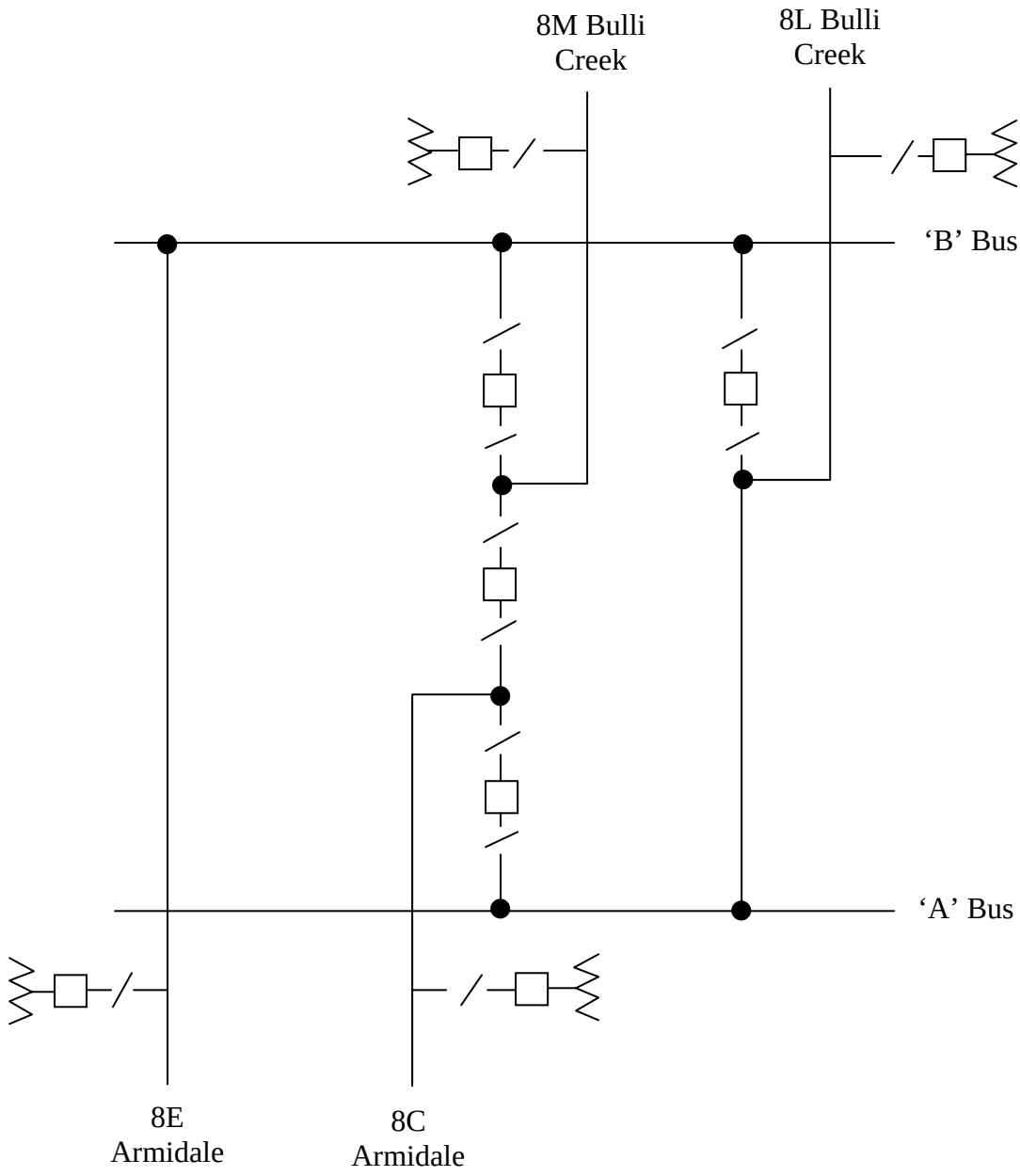

Figure 1
Present Connection Arrangement at Dumaresq

TransGrid Initial Proposal

The connection of the Dumaresq to Lismore line will require further circuit breakers to be installed to complete the breaker and half arrangement. The initial proposed arrangement at Dumaresq for connection of the line to Lismore is shown in figure 2 below.

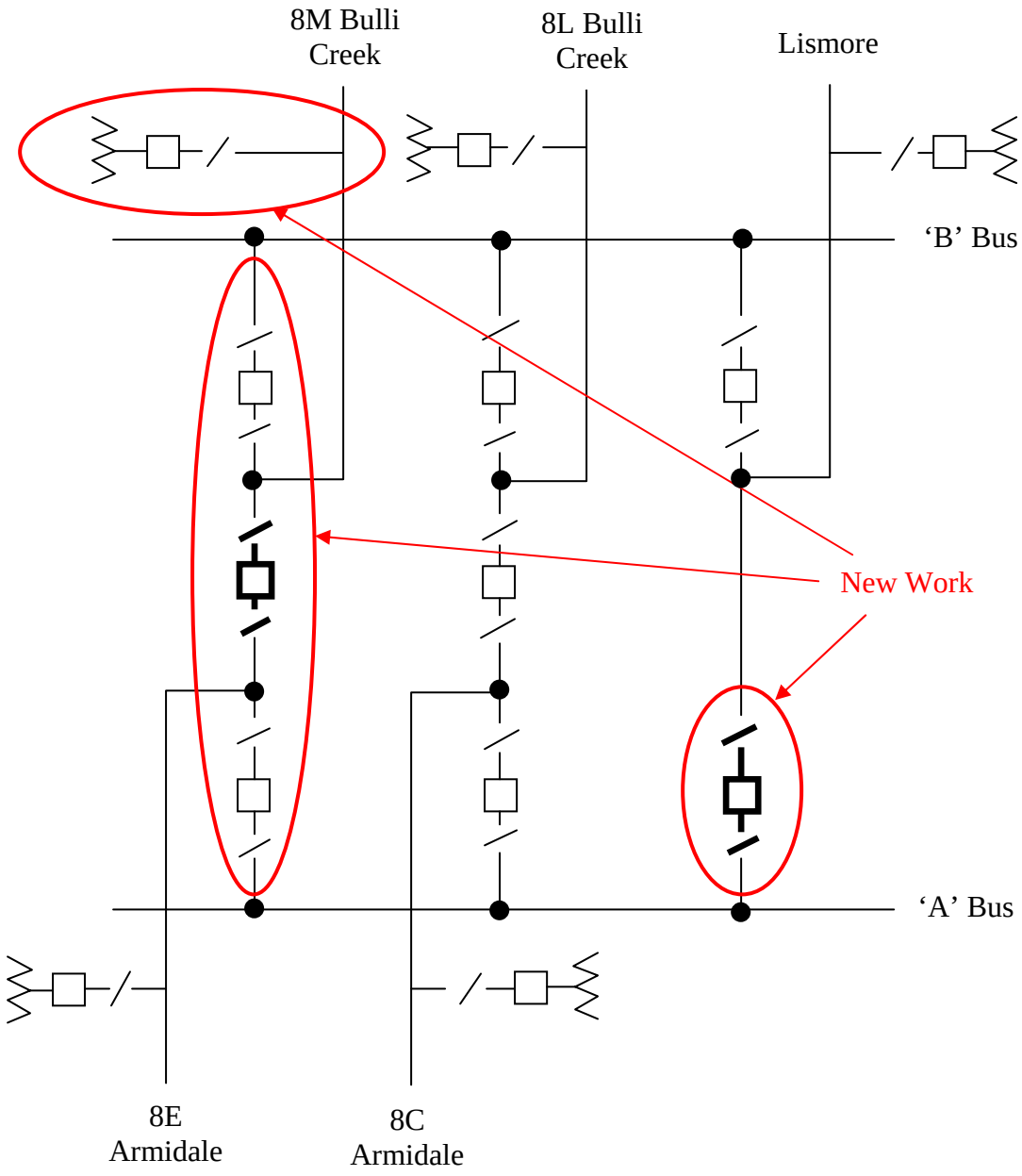

Figure 2
TransGrid Proposed Connection Arrangement at Dumaresq

AER Findings

The PB report states:

> *The substation works at Dumaresq require five new circuit breakers to be installed in a breaker and half arrangement. In PBs view two of these circuit breakers only provide limited benefits under normal situations (but they do marginally improve operational flexibility and increase the extent of redundancy).*

While not identified in the PB report, correspondence between PB and TransGrid has identified the circuit breakers to be the centre circuit breaker in the breaker and half scheme, and the second circuit breaker for the Lismore line shown in bold in Figure 2.

The AER draft decision states

> *The AER agrees with PB's findings that TransGrid has not reasonably demonstrated that all of the circuit breakers identified by TransGrid are required by a prudent and efficient TNSP in TransGrid's circumstances*

The net financial result of this decision to remove two circuit breakers is a reduction of $2.6M

The connection arrangement proposed by the AER for Dumaresq is shown in Figure 3.

The AER provided no analysis to support the proposed busbar arrangement is reasonable.

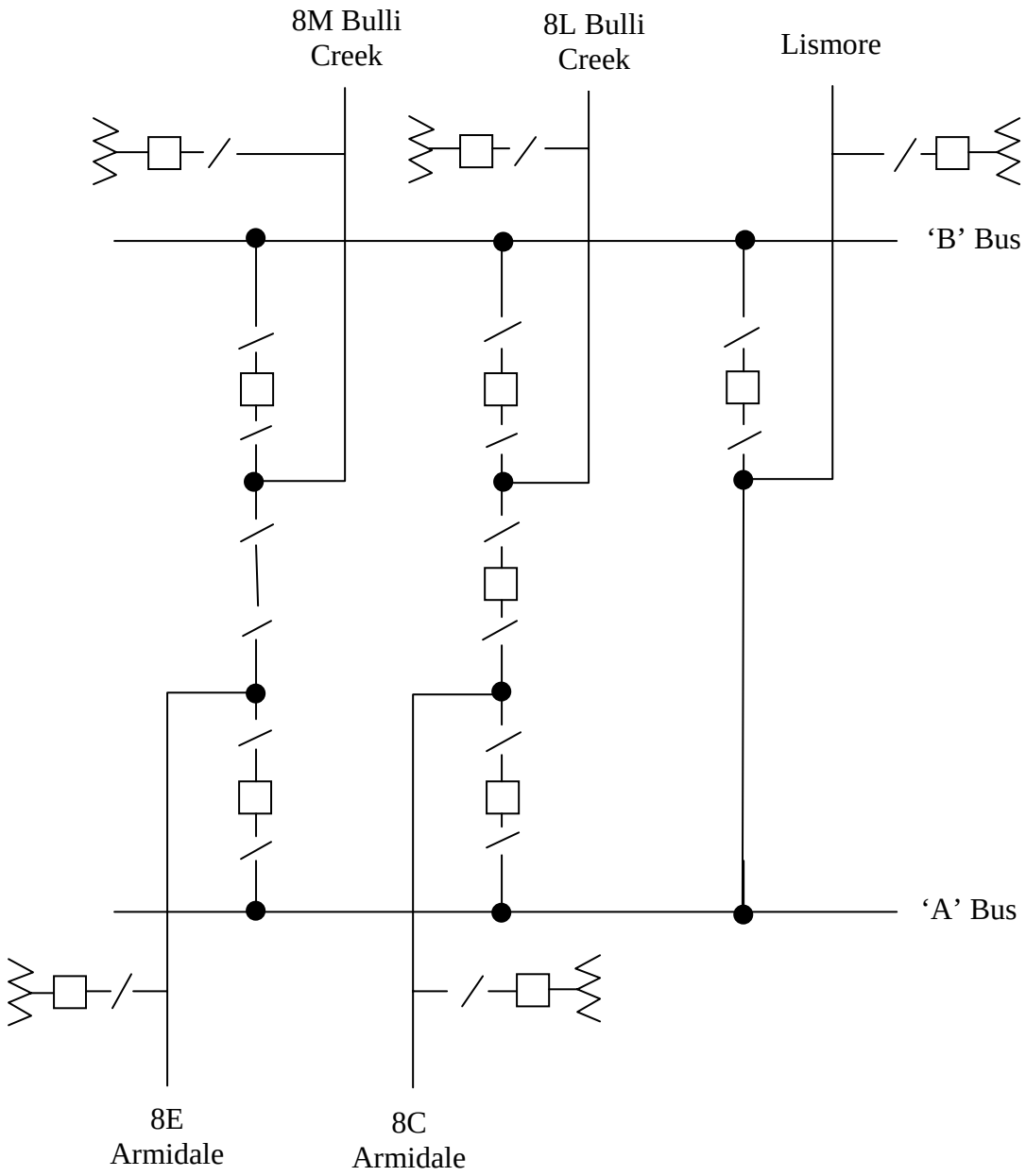

Figure 3
AER Proposed Connection Arrangement at Dumaresq

TransGrid's Response

TransGrid concurs with PB's opinion that the connection of the Lismore line through a double breaker arrangement that it offers greater operational flexibility and reliability. However, TransGrid is prepared to accept the AER's advice that the higher customer service levels delivered by this arrangement do not justify the additional expenditure.

TransGrid does not concur with the AER's advice that the removal of the centre circuit breaker in a breaker and half arrangement is either efficient or prudent. TransGrid believes that the arrangement proposed by the AER is:

- inconsistent with good electricity industry practice for the major flow paths;
- imposes a substantive reduction in reliability and operational flexibility from that which presently is in place and for which this switching station has been designed;
- will require the introduction of additional constraints on the flowpath to undertake maintenance that could otherwise be avoided. These constraints may potentially have a significant financial impact on market participants;
- will require the separation of Queensland from the remainder of the NEM for the maintenance of equipment in the single centre switchbay. TransGrid believes the separation of Queensland from the remainder of the NEM may have a significant financial impact on market participants.

TransGrid has considered the issues raised by the AER and believes the arrangements proposed by the AER to remove the centre circuit breaker is highly inappropriate and the AER has not acted reasonably. TransGrid therefore seeks to have the value of $1.3M for this circuit breaker restored. TransGrid's revised proposed arrangement is shown in Figure 4.

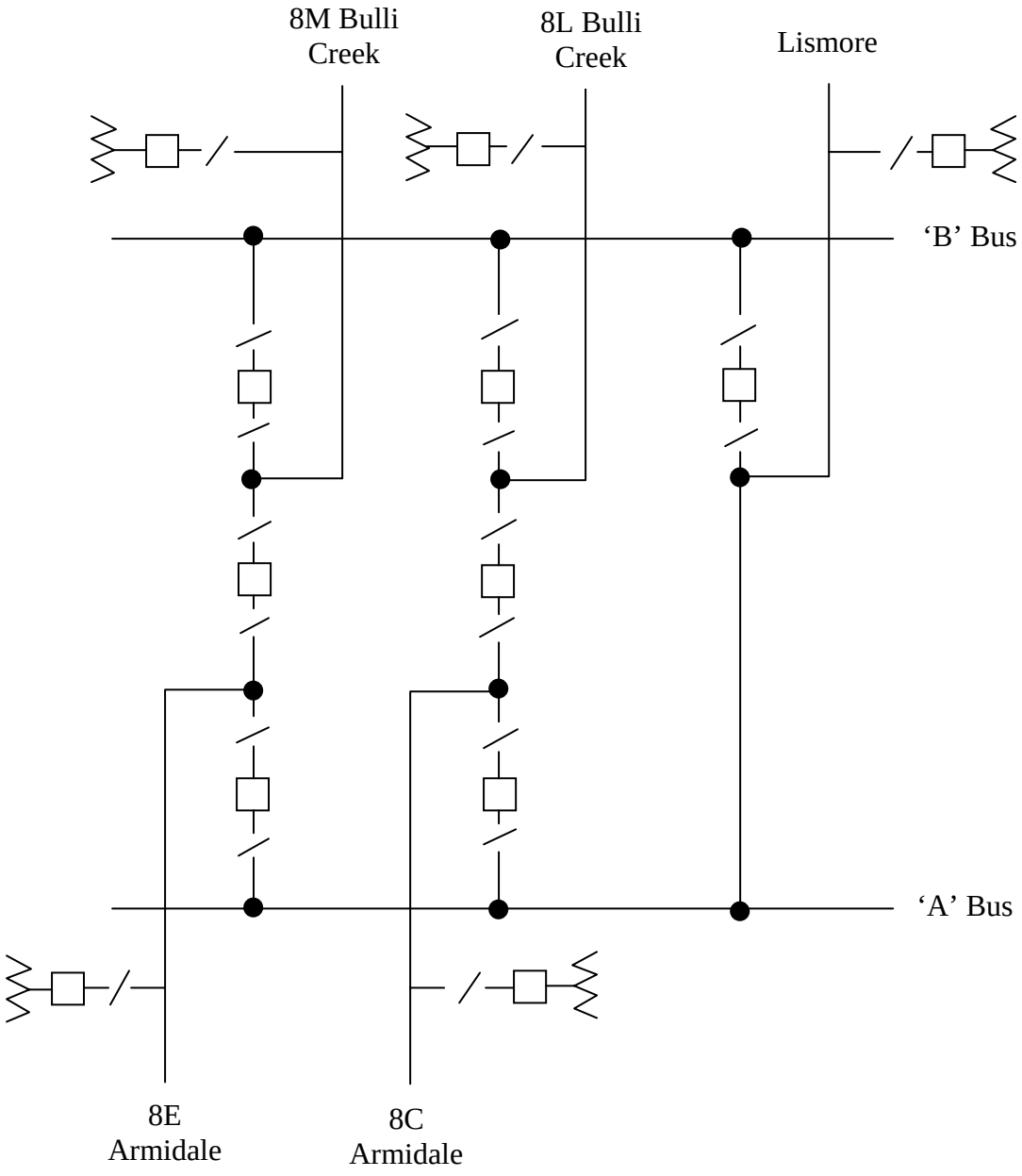

Figure 4
TransGrid Revised Proposed Connection Arrangement at Dumaresq