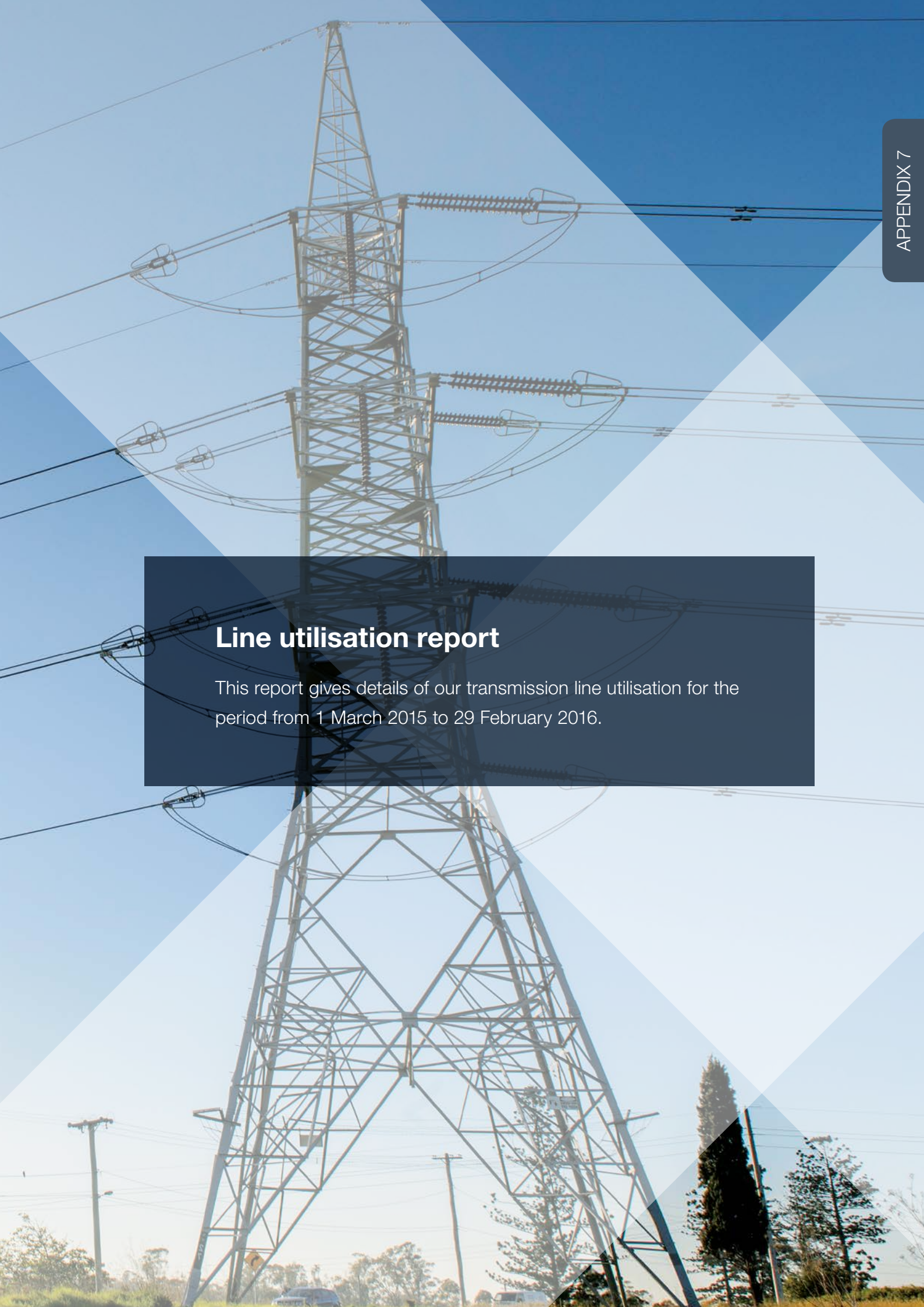
Appendix

7



Line utilisation report

This report gives details of our transmission line utilisation for the period from 1 March 2015 to 29 February 2016.

Line utilisation report

The line loading information over the analysis period was obtained from AEMO's Operation Planning and Data Management System (OPDMS). This system produces half hourly system load flow models (snapshots) of the NEM.

For each half hour period, the utilisation (loading) of each line was calculated as a proportion of the relevant rating. The highest values of these proportions are reported here.

The utilisation of each line was calculated based on two conditions:

> With all network elements in service, referred to as the 'N utilisation'. These utilisation figures are based on normal line ratings

> With the most critical credible contingency (usually an outage of another line in the area), referred to as the 'N–1 utilisation'. These utilisation figures are based on the line contingency ratings.

The N utilisation and N–1 utilisation of the transmission lines in the NSW transmission network are shown in Figures 2 to 10. For each line, the utilisations are shown in the box placed adjacent to the line. The box shows:

A. The transmission line number

B. The maximum N utilisation of the transmission line

C. The maximum N–1 utilisation of the transmission line

D. The number of the line that creates the critical contingency in the event of an outage.

The utilisation is shown in Figure 1.

FIGURE 1 – Key to interpreting the information shown in Figures 2 to 10

In some situations, the N–1 utilisation has been estimated to be more than 100%. These situations could be because of:

> A higher level of line loading being allowed, considering the operational line overloading control schemes, run-back schemes available for managing the line loadings, and generation redispatch capability by AEMO

> The predicted dispatch conditions that change over the five-minute dispatch period, causing the line loadings to increase above the predicted values.

FIGURE 2 – TransGrid N and N–1 line utilisations – Sydney and Newcastle

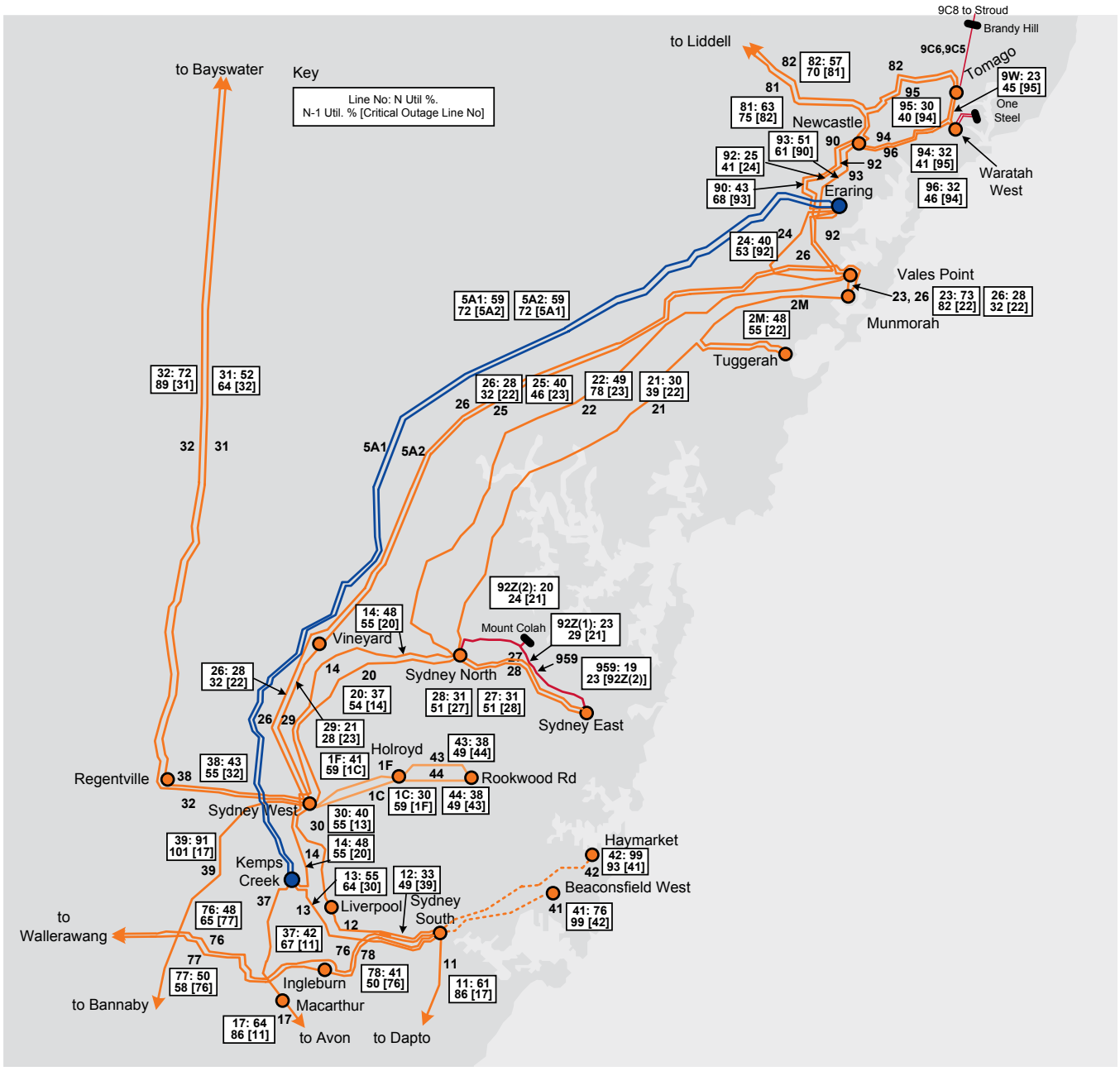


FIGURE 3 – TransGrid N and N–1 line utilisations – North East NSW and Hunter Valley

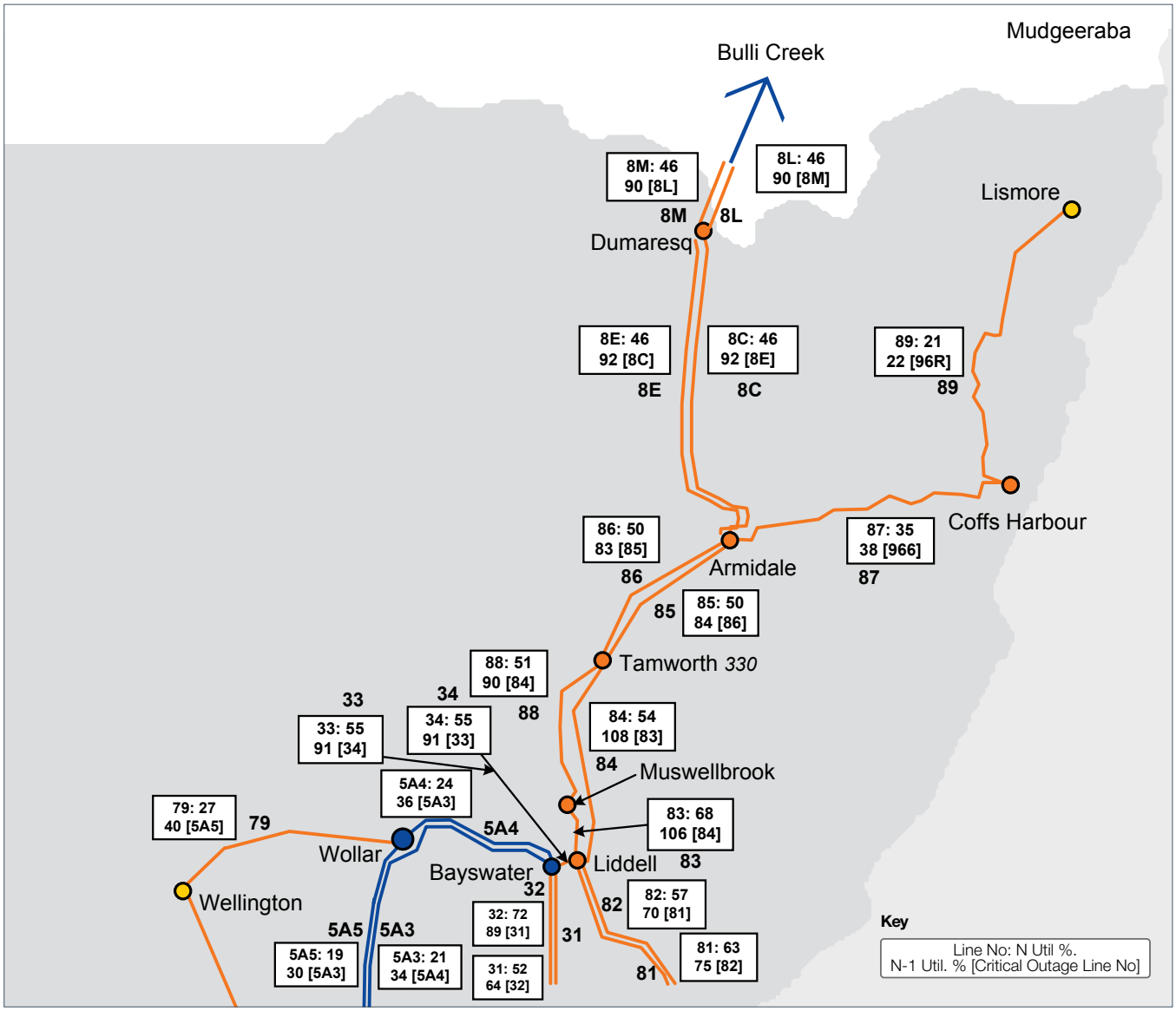


FIGURE 4 – TransGrid N and N–1 line utilisations – Hunter Valley

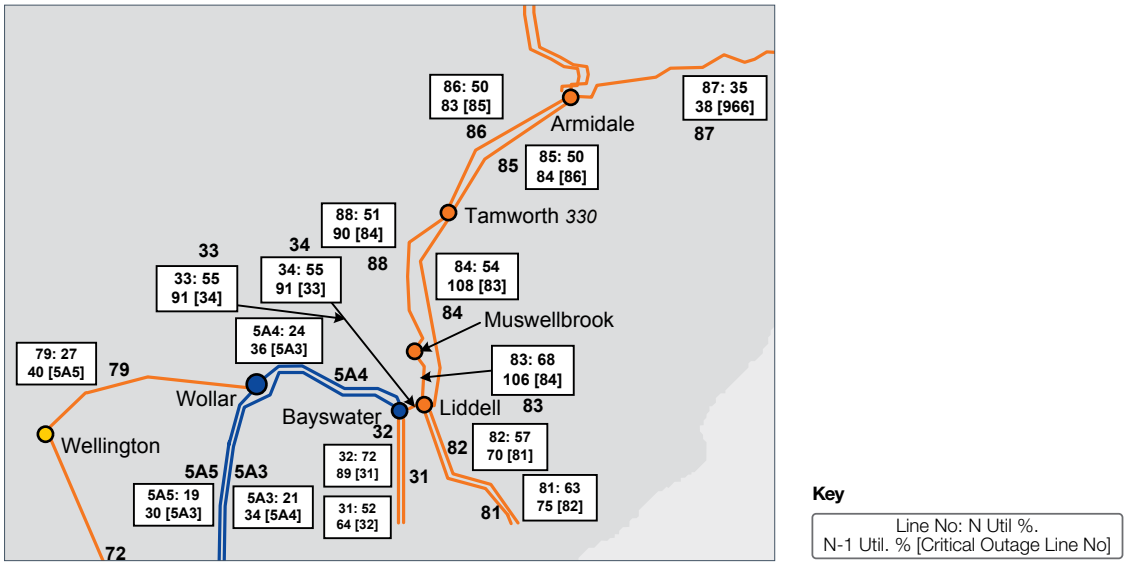


FIGURE 5 – TransGrid N and N–1 line utilisations – South and South East

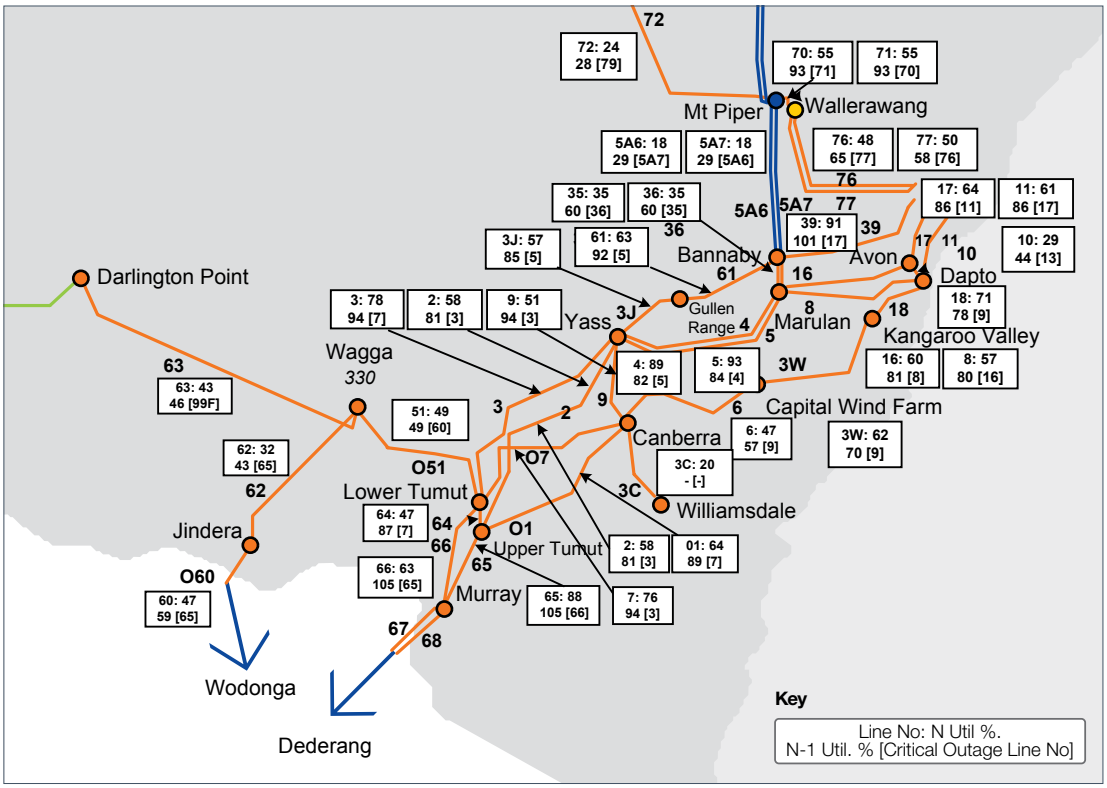


FIGURE 6 – TransGrid N and N–1 line utilisations – Far West

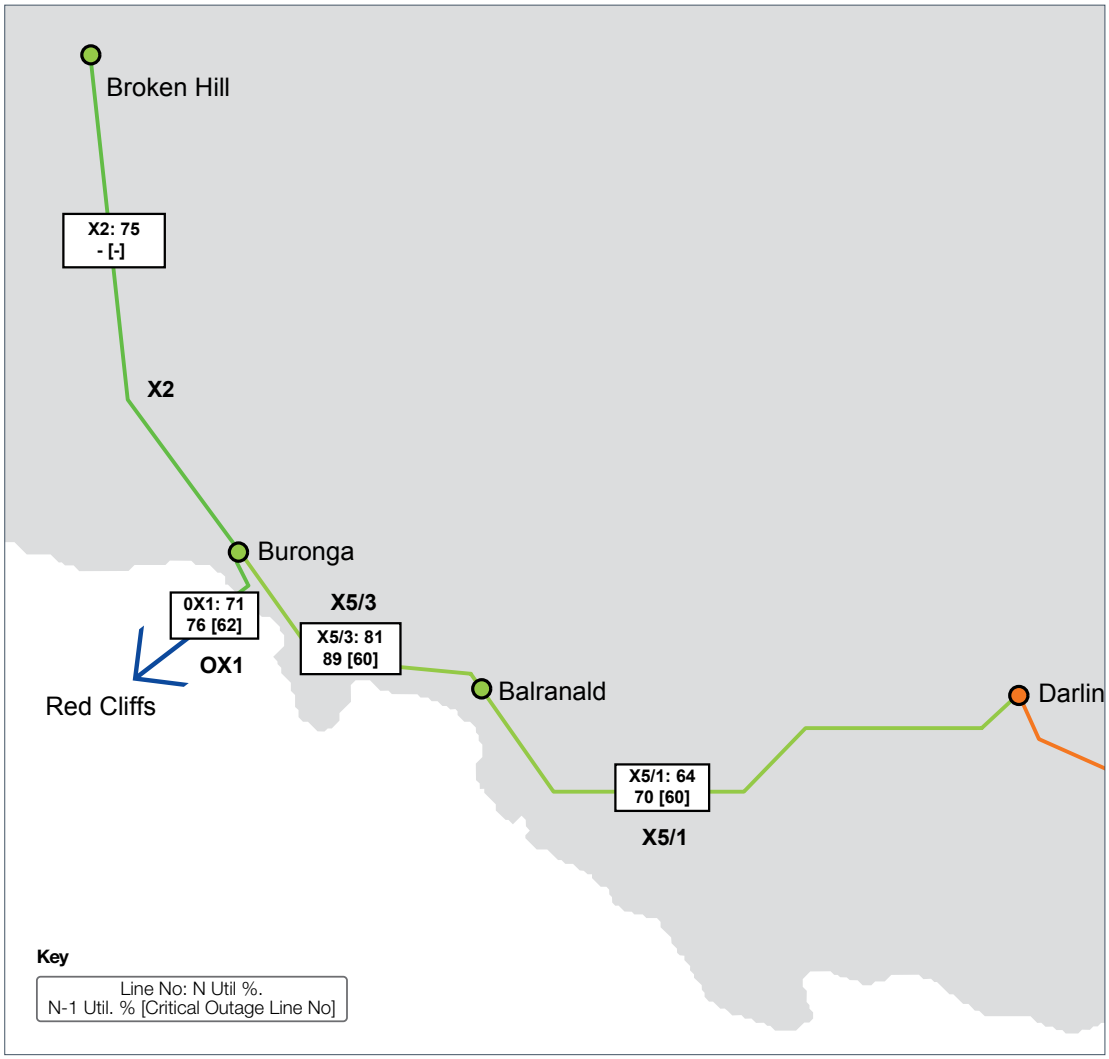


FIGURE 7 – TransGrid N and N–1 line utilisations – North Coast and North West 132 kV System

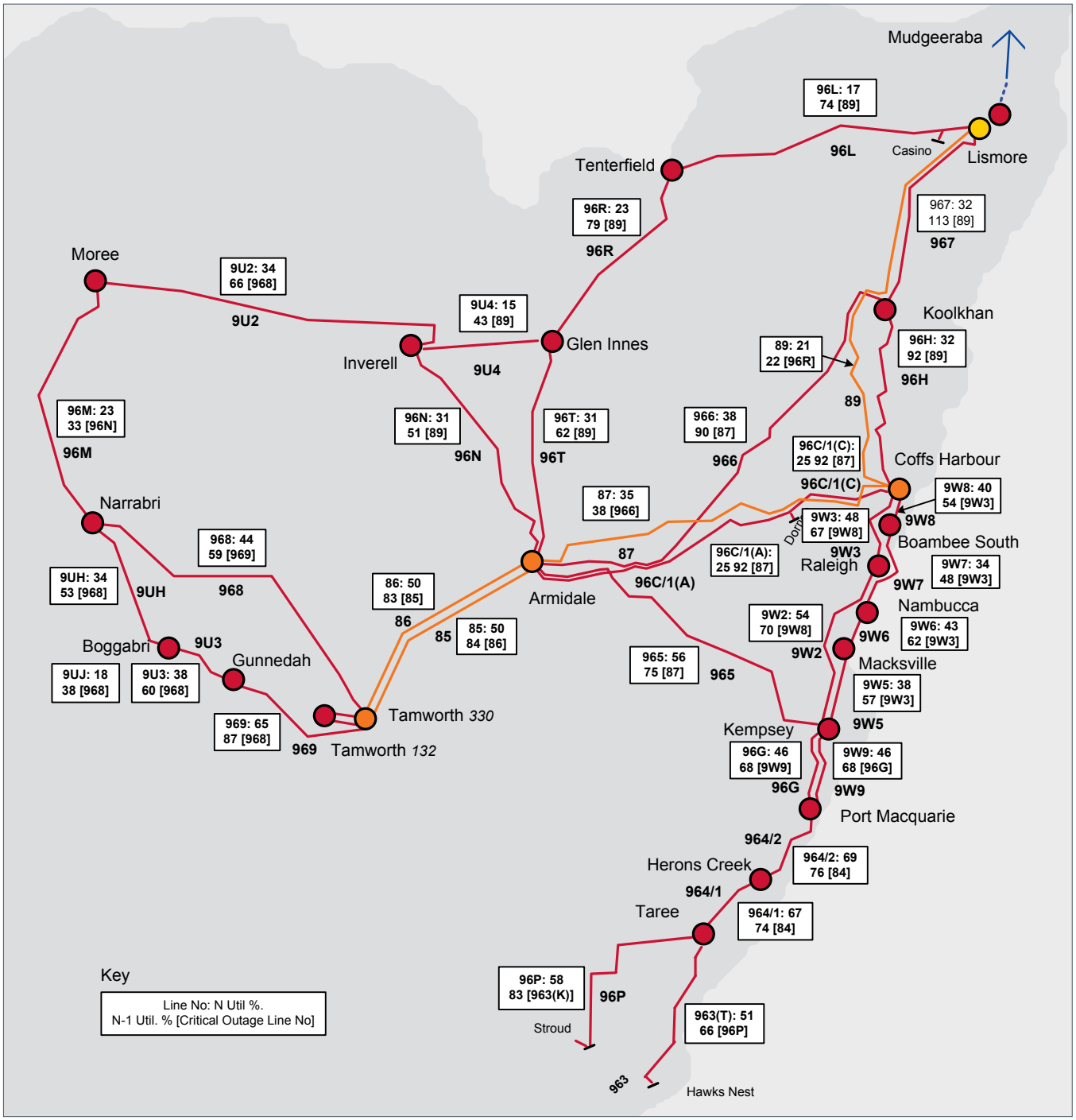


FIGURE 8 – TransGrid N and N–1 line utilisations – Central West

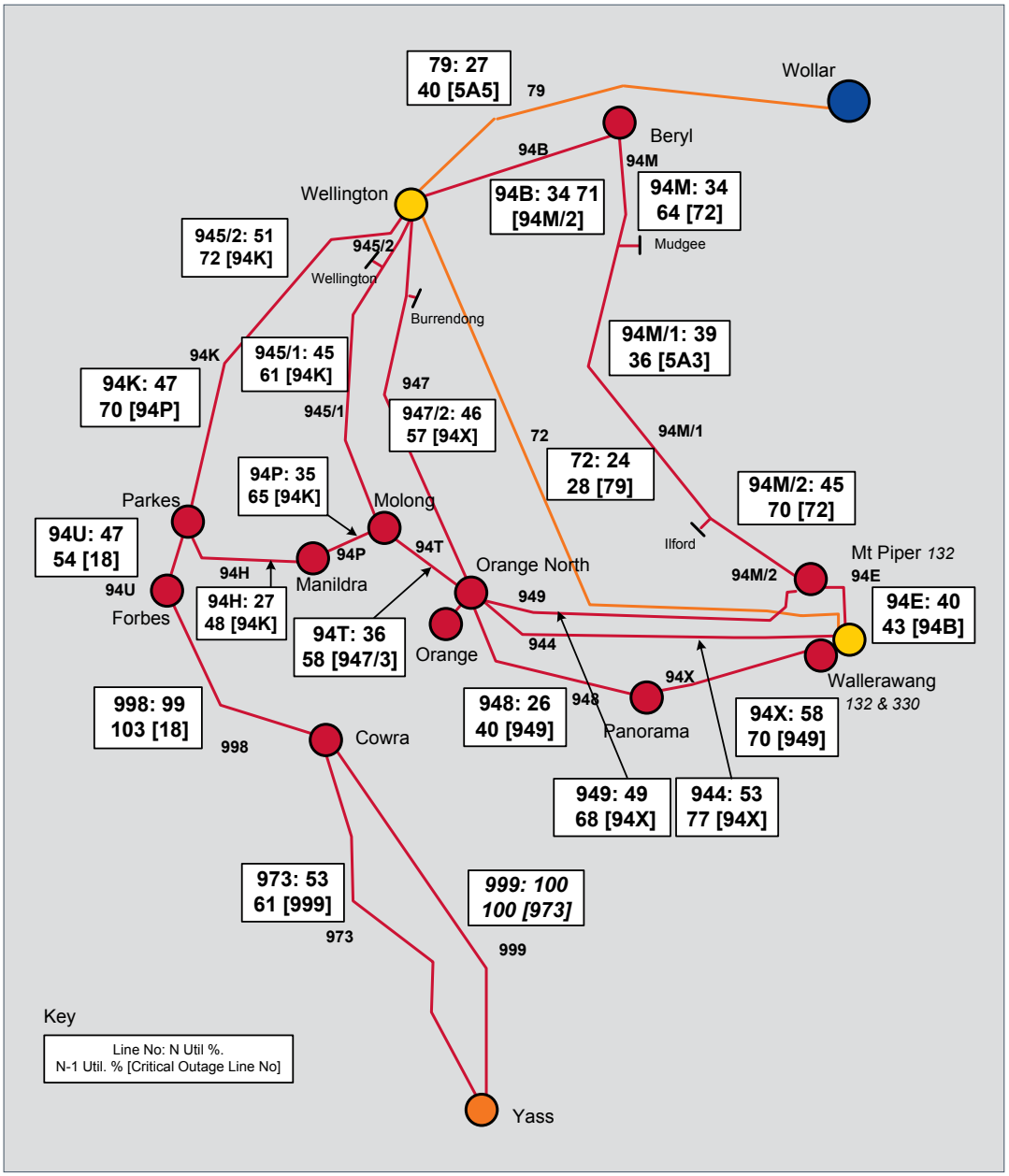


FIGURE 9 – TransGrid N and N–1 line utilisations – South and Snowy

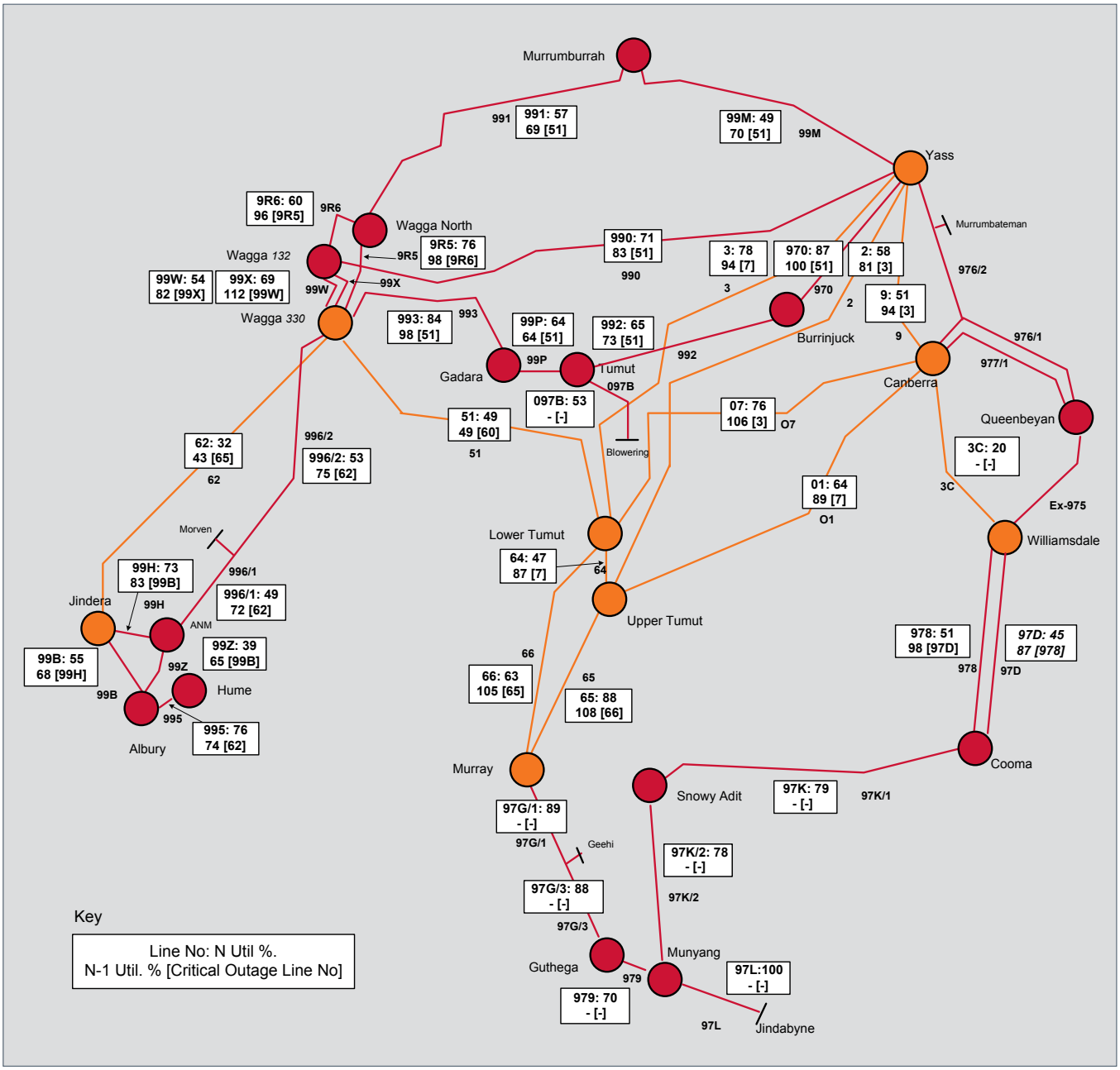
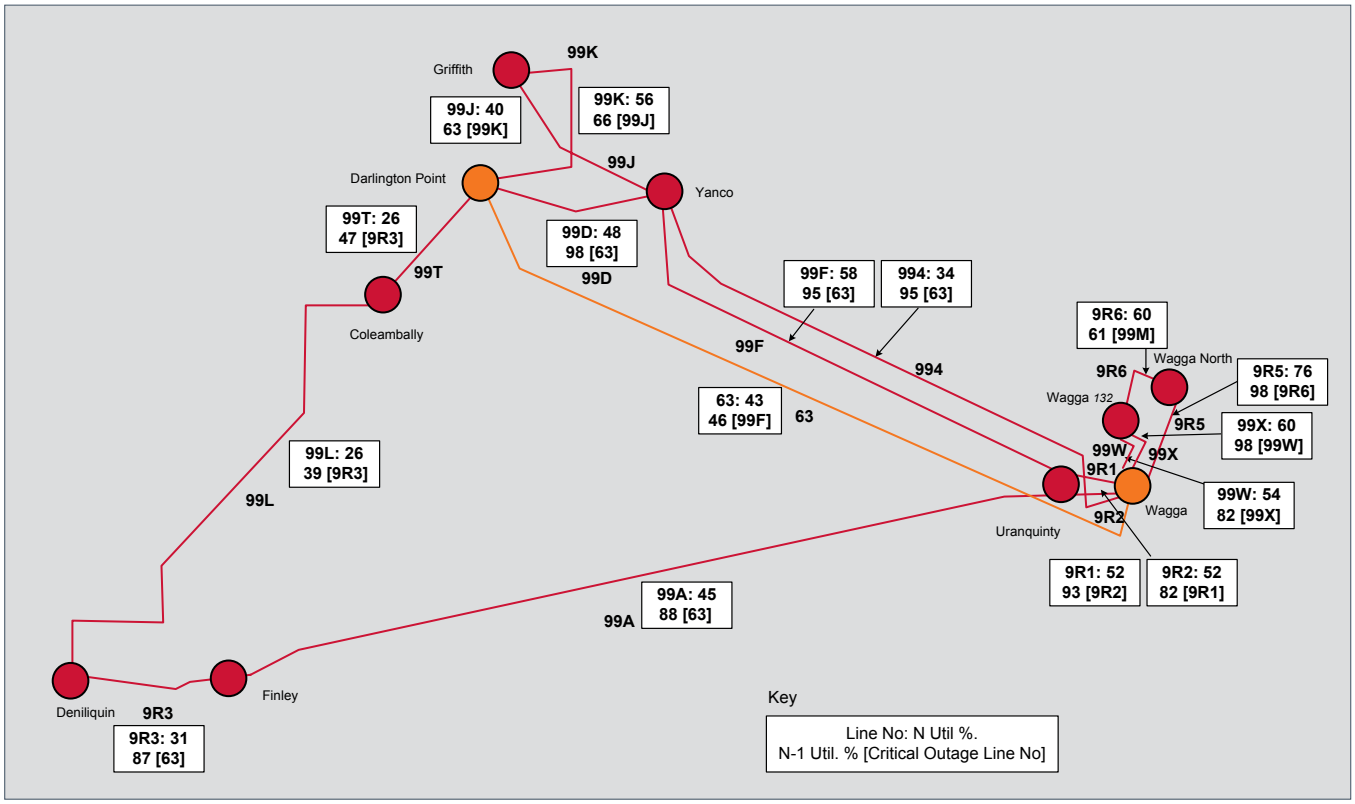


FIGURE 10 – TransGrid N and N–1 line utilisations – South West



Summary of the N–1 utilisation of the transmission lines in the TransGrid's network

The distribution of the utilisation of the transmission lines across our network is shown in Figure 11.

The distribution shows that approximately 7% of the transmission lines in the network are utilised up to their installed maximum capacity. Approximately 38% of the lines utilise more than 80% of their installed capacity. On the other hand, approximately 16% of the transmission lines are presently only utilised between 30% and 50% of their installed capacity, representing the 'step' increments in the transmission capacity, as the network is augmented by building new transmission lines. The new augmentations are built with the expectation of providing adequate capacity over their asset lives of approximately 40 to 50 years.

The distribution of the N–1 line utilisations reflects at least 40 years of planning history of the transmission network. It is considered to be typical of a well-planned network where various parts of the network are well-established, while other parts have had recent step augmentations that will be further utilised in future years.

FIGURE 11 – Distribution of TransGrid line N–1 utilisations (01/03/2015-29/02/2016)