

NEED/OPPORTUNITY STATEMENT (NOS)



Making the Grid Smarter - North Western Transfer Tripping Scheme

NOS- 00000001477 revision 2.0

Ellipse project description:

TRIM file: [TRIM No]

Project reason: The project improves system security at customer connection points.

Project category: Prescribed - NCIPAP

Approvals

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Reviewed/Endorsed	Jahan Peiris	Network Modelling & Performance Manager
	Hoang Tong	Operations Analysis Manager
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Approved	Andrew Kingsmill	Manager/Power System Analysis
Date submitted for approval	6 December 2016	

1. Background

This proposal forms part of the Network Capability Incentive Parameter Action Plan (NCIPAP), for the 2018/19 to 2022/23 regulatory control period. The NCIPAP portion of the STPIS described in section 5 of the STPIS guideline¹ is a plan consisting of a suite of small projects aimed at improving the capability of transmission assets through operational expenditure and minor capital expenditure on the transmission network which results in:

- > Improved capability of those elements of the transmission system most important to determining spot prices;
OR
- > Improved capability of the transmission system at times when Transmission Network Users place greatest value on the reliability of the transmission system.

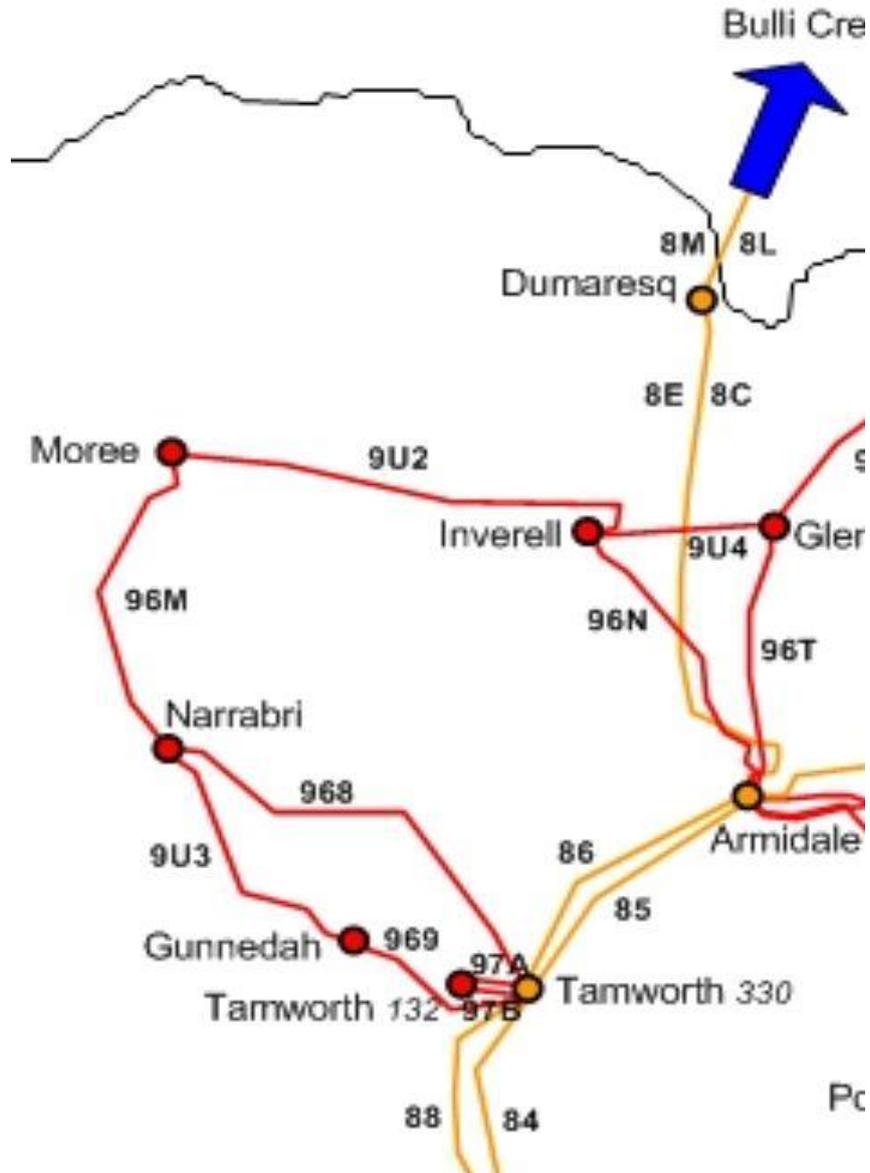
This project proposes a *priority project* to improve the limit of the injection point for the benefit of the Transmission Network Users. This *priority project* is consistent with the requirements of the clause 5.2(a)(2) in section 5 of the STPIS guideline and is consistent with the objectives of the NCIPAP scheme².

The north western area of NSW is supplied by a network of 132 kV lines emanating from 330/132 kV substations at Tamworth and Armidale. The transmission network to the north western area comprises of three 132 kV “rings”. The first ring connects Tamworth, Gunnedah, and Narrabri, the second ring connects Tamworth to Narrabri, Moree, Inverell, and thence to Armidale; the third ring connects Armidale, Inverell and Glen Innes. These three rings together form the 132 kV subsystem of the North West area network. The North West subsystem is backed by two 330 kV lines between Tamworth and Armidale (85 and 86) as shown in figure 1.

¹ AER, Final Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme, Version 5 October 2015.

² Explanatory statement section 5.3.1 - AER, Draft Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme, Version 5 June 2015.

Figure 1: Transmission Network in North West area



For the loss of both 330 kV lines between Tamworth and Armidale, the north western 132 kV network could experience excessive loading and voltage stability issues.

2. Need/opportunity

The implementation of a transfer tripping scheme in the north western area to split the 132 kV network during the outages of both 85 and 86 330 kV lines to protect the north western 132 kV network from excessive loading and voltage stability issues.

This North Western Transfer Tripping Scheme would be armed during outages of line 85 or 86. This scheme would then open line 96M at Moree in protection clearing time following a trip of the adjacent Tamworth to Armidale circuit. This would require communication fibre around the north western 132 kV ring.

Presence of such a scheme will facilitate Moree Solar Farm generation during these 330 kV line outages realising benefits to the NEM.

Therefore, with this proposed *priority project*, the post contingent capacity at the supply point can be improved as follows:

Option	Post contingency (with prior outage of Line 85 or 86) capacity
Do nothing	0 MW ³
Implementation of a transfer tripping scheme	56 MW (the full Moree Solar Farm generation capacity)

3. Related needs/opportunities

Nil.

4. Recommendation

It is recommended that the installation of a transfer tripping scheme in North Western area be included in TransGrid NCIPAP for the regulatory period 2019 – 2023.

³ The present scheme will constraint generation from Moree solar farm to zero during about 30 hours/ year planned and 167 hours/year unplanned outages.

Attachment 1 Market benefit summary

The benefit of implementing a transfer tripping scheme to allow the generation from Moree solar farm during the planned or forced outage of 85 or 86 lines per year is assessed below:

- Average generation cost of thermal generation compared to renewable generation⁴ = \$25/MWh
- Moree solar farm constrained = Average Moree solar output⁵ x Market impact per MWh constrained x total outage hour (planned and unplanned outages of 85 or 86 lines⁶)
$$= 18.24 \text{ MW} \times \$25/\text{MWh} \times (30+167) = \$ 90 \text{ K/year}$$

Using the above assumptions and calculation, the market benefits is assessed to be \$0.09 million per year.

⁴ Based on the NSW Black Coal variable costs of \$25 – refer page 61 of Jacobs report “Retail electricity price history and projections.pdf” filed in PDGS supporting documents. Typical bid price for renewable (wind/solar) generation is either \$0 or negative. Accordingly, Market impact = \$25 - \$0 = \$25.

⁵ Based on historical NSW prices Moree solar farm generation – refer to file “1477 – Risk Assessment” in PDGS for details

⁶ TransGrid historical asset performance assessment – as at May 2016