

NEED/OPPORTUNITY STATEMENT (NOS)



Making the Grid More Flexible - Installation of Transfer Tripping Scheme at Cooma

NOS- 00000001459 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	Hoang Tong	Operations Analysis Manager
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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:

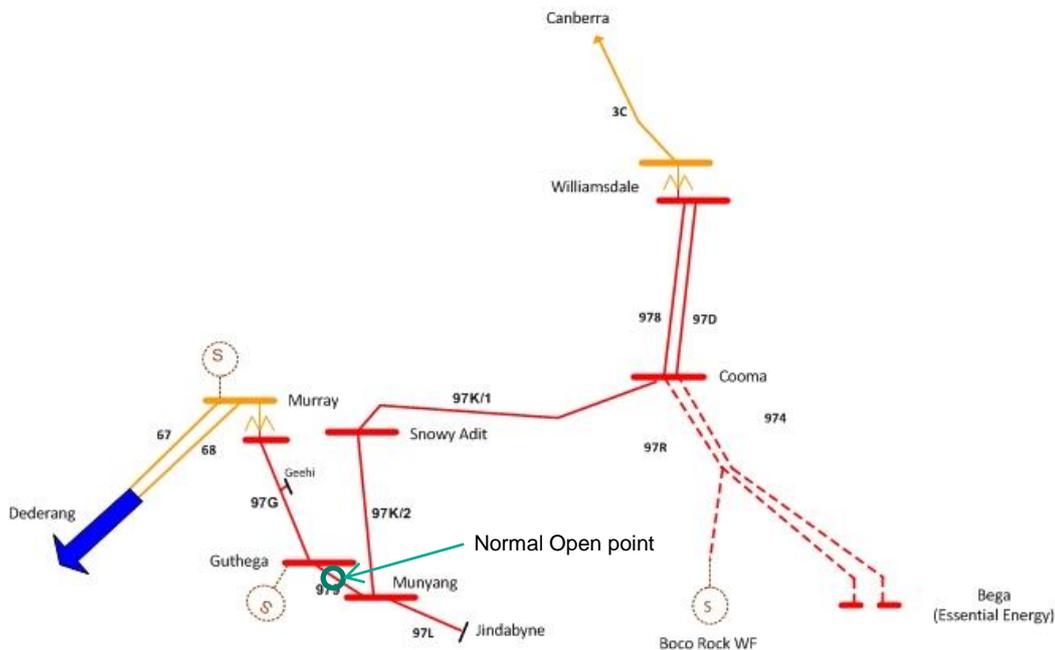
- > Improved capability of those elements of the transmission system most important to determining spot prices;
OR
- > Improved capability of the transmission system at times when Transmission Network Users place greatest value on the reliability of the transmission system.

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 132 kV transmission network supplying Cooma, Bega and Muryang load areas consist of two 132 kV lines 97B and 97D from Williamsdale to Cooma. From Cooma TransGrid's 132 kV network extends west to Snowy Adit, Muryang, Guthega and then to Murray. The 132 kV interconnection between Murray and Williamsdale 330 kV substations via Cooma 132 kV substation is normally open at Guthega on the 979 line Guthega –Muryang. From Cooma Essential Energy's 132 kV network extends east with two 132 kV lines 97R and 974 to supply Bega load area.

Figure 1 shows the schematic of the transmission network in this area. This network also provides connection points to the hydro generators at Guthega and the wind farm at Boco Rock.

Figure 1: Transmission Network in Cooma area.



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.

2. Need/opportunity

During the outage of line 978 or 97D, and the tripping of the other circuit will result in an island consisting of Cooma, Munyang, Bega loads and the Boco Rock wind farm. For this reason, the generations in the area are constrained to 0 MW for the outage of line 978 or 97D.

The installation of a transfer tripping scheme at Cooma could be used to disconnect generation at Boco Rock in the event of an islanded situation following a contingent trip of line 978 or 97D during an outage of the other. The presence of such a scheme will enable continued operation of Boco Rock Wind Farm during the outage of line 978 or 97D providing market benefits.

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

Option	Post contingency (outage of line 978 or 97D) capacity
Do nothing	0 MW
Installation of a transfer tripping scheme to disconnect generation at Boco Rock	113 MW (Boco Rock maximum output capacity)

3. Related needs/opportunities

Nil.

4. Recommendation

It is recommended that the installation of transfer tripping scheme at Cooma be included in TransGrid NCIPAP for the regulatory period 2018 – 2023.

Attachment 1 Market benefit summary

The market benefit of implementing a transfer tripping scheme to allow the Boco Rock wind farm to generate during an outage of line 978 or 97D lines per year is assessed based on the following assumptions below:

- Boco Rock maximum output capacity is 113 MW
- Boco Rock is on average outputting 33% of its maximum capacity³
- Planned outage rate: 1 in every 2 years per line for 24 hours⁴
- Forced outage rate: 0.3 per year per line for 24 hours⁵
- Average generation cost of thermal generation compared to renewable generation⁶ = \$25/MWh

$$\begin{aligned}\text{Market Impact} &= [(\text{planned outage rate}) \times (\text{planned outage duration}) \times (\text{number of lines}) + (\text{forced outage rate}) \times \\ & \quad (\text{forced outage duration}) \times (\text{number of lines})] \times (\text{generation spot price}) \times (\text{generation max. output}) \times \\ & \quad (\text{generation average output factor}) \\ &= [(0.5 \times 24 \times 2) + (0.3 \times 24 \times 2)] \times 25 \times 113 \times 0.33 \\ &= \$35,800 /\text{year}\end{aligned}$$

Using the above assumptions and calculation, the market benefits is assessed to be \$0.036 million per year.

³ Typical plant factor for Wind Farm generators in NSW

⁴ Based on TransGrid historical outage schedules

⁵ Based on TransGrid historical reliability statistics – refer file Reliability Analysis - Final Summary.xlsx in PDGS; 132 kV line – 3.9 failures per 100 km per decade, length of 978 = 73.8 km, 97D = 79.4 km, Average length for 978 and 97D = 76.6 km,

⁶ 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.