NEED/OPPORTUNITY STATEMENT (NOS)

Beaconsfield 132 kV Connection – Replacement of Ausgrid Cables 9SA and 92P

NOS- 000000001440 revision 5.0

Ellipse project description: Beaconsfield 132 kV Replacement of Ausgrid Cables 9SA and 92P
TRIM file: [TRIM No]

Project reason: Capability - Asset Replacement for end of life condition
Project category: Prescribed - Replacement

Approvals

Author	Ronny Schnapp	Network and Connection Analysis Engineer
Reviewed	Charbel Lahoud	Network and Connection Analysis Engineer
Endorsed	Vincent Ong	Network and Connection Analysis Manager
Approved	Andrew Kingsmill	Manager / Network Planning
Date submitted for approval	[Publish Date]	

1. Background

Ausgrid has an extensive 132 kV cable supply network in the Sydney metropolitan area. TransGrid's Beaconsfield 330/132 kV Substation supplies Ausgrid's cables 9SA and 92P to Campbell St and Belmore Park substations, respectively.

Figure 1 on page 4 shows the high voltage operating diagram of the relevant 132 kV yard of Beaconsfield Substation.

2. Need/opportunity

Ausgrid is presently revising its 132 kV cable retirement program for the inner metropolitan area. Ausgrid has informed TransGrid that at this time, it plans to replace 132 kV cables 9SA and 92P Beaconsfield to Campbell St and Beaconsfield to Belmore Park, respectively, in 2023. The replacement is being considered as "like-for-like" and solely driven by the condition of the cables.

Ausgrid has requested via the Joint Planning process that TransGrid carry out appropriate works to disconnect the existing cables and connect and commission the new cables at the Beaconsfield Substation end.

2.1 Risks

The National Electricity Rules (NER) clause 5.14 – Joint Planning requires TransGrid (and Ausgrid) to jointly plan their regional electricity network. In this case, should TransGrid not participate with Ausgrid in addressing this Need, it would be violating this statutory obligation.

The load at risk which is being assessed here is the forecast peak loading on the cables of 350 MW in 2020[1], multiplied by a load factor of 0.8.[2] This estimates that the load supplied by the cables are most likely to be at 80% of their peak loading when an outage occurs.

Assuming a load power factor of 0.95 (minimum NER requirement under clause S5.3.5), this equates to $350 * 0.8 = 280$ MW.

The risk cost of not addressing this Need is therefore composed of the following components:

- exposing customer load of 280 MW to risk of being unsupplied.
- damage to TransGrid's reputation (negative media coverage).
- litigation by customers/consumer groups.

The total cost of these risks has been calculated in TransGrid's Investment Risk Tool thus:

VCR Risk Cost (Unserved Energy)

$$VCR\ risk\ cost = load\ at\ risk * probability\ of\ cables\ not\ available\ for\ one\ day^{3} * VCR^{4}$$

$$\therefore VCR\ risk\ cost = 280\ MW * 24\ hrs * \$38{,}350/MWh$$

$$\boldsymbol{\therefore VCR\ risk\ cost = \$257.71\ million\ \ per\ annum}$$

Reliability Risk Cost

$$Reliability\ risk\ cost = VCR\ risk\ cost + litigation\ costs$$

[1] Ausgrid 2015, *Distribution and Transmission Annual Planning Report*, Dec 2015.

[2] Load factor = average demand / maximum demand over the period assessed.

[3] This is a snapshot of the risk cost during a single day of summer 2022/23.

[4] TransGrid's Investment Risk Tool bases the Value of Customer Reliability (VCR) on figures published by AEMO in its *Value of Customer Reliability Review - Final Report*, September 2014. In this case we use the mixed residential/industrial figure of $38,350/MWh.

$$\therefore \textbf{Reliability risk cost} = \$257.7m + \$0.06m^{5} = \$257.76 \textbf{ million per annum}$$

Financial Risk Cost

$$Financial\ risk\ cost\ = internal\ investigation\ costs = \$0.25^{6}$$

Reputational Risk Cost

$$Reputational\ risk\ cost\ = external\ consultations\ \&\ communications\ costs = \$0.85^{7}$$

Total Risk Cost

$$Total\ risk\ cost = Reliability\ risk\ cost + Financial\ risk\ cost + Reputational\ risk\ cost$$

$$\therefore \textbf{Total risk cost} = \$258.86 \textbf{ million per annum}$$

A risk-cost summary extract from the Investment Risk Tool appears in Attachment 1.

3. Related needs/opportunities

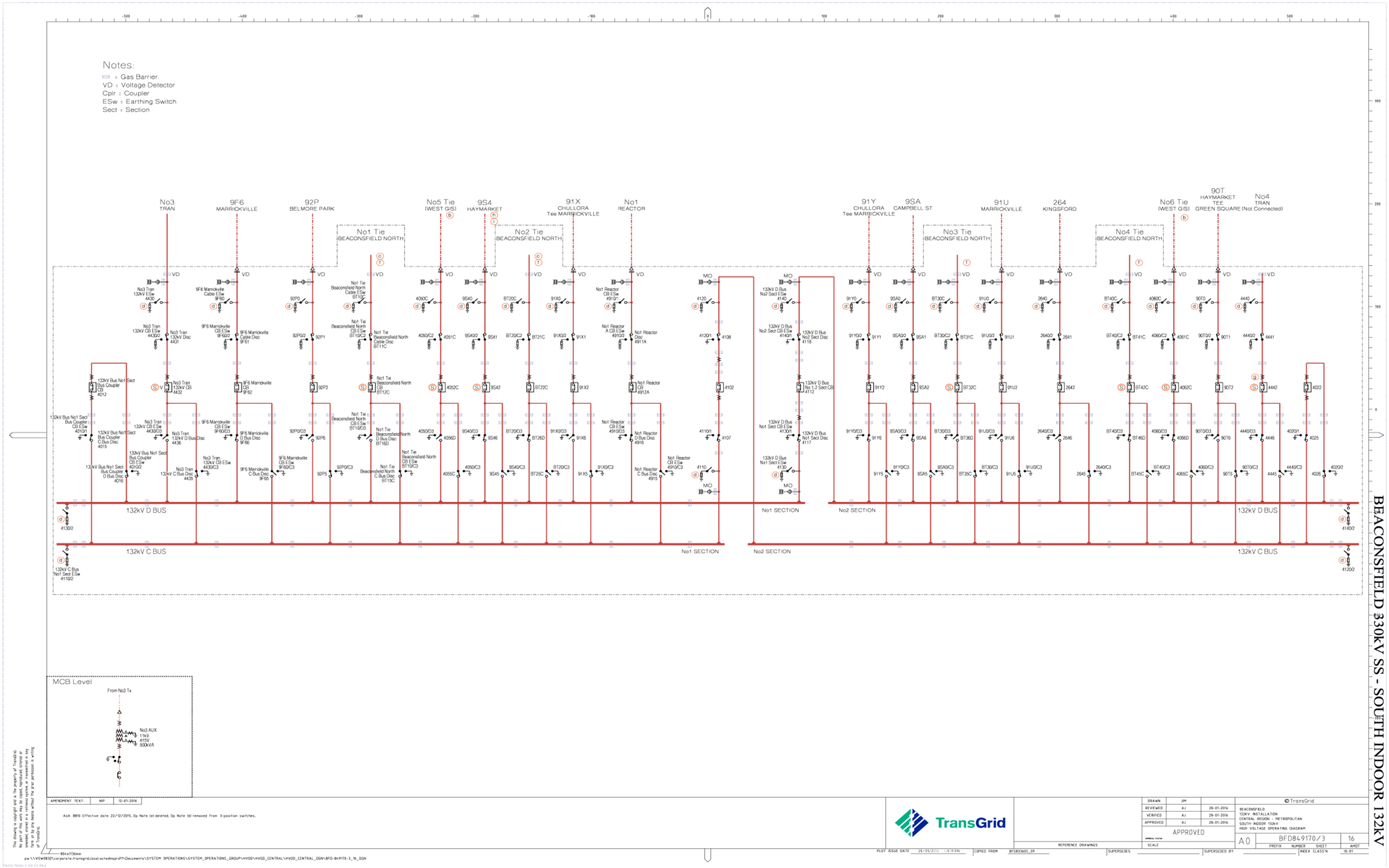
> Need 43 – Powering Sydney's Future
> Need 1440 is independent of Need 43. These Needs are related only in that they apply to the same geographical area.

4. Recommendation

It is recommended that an OFR and OFS be completed for the connection of Ausgrid's "like-for-like" replacement cables of 9S4 and 92P.

[5] This component is an assumed litigation risk cost of this event.
[6] This component is an assumed financial risk cost of this event.
[7] This component is an assumed reputational risk cost of this event.

Figure 1: Beaconsfield 330/132 kV Substation High Voltage Operating Diagram



Attachment 1 Risk Assessment and Risk Cost Summary

Current Option Assessment - Risk Summary

Project Name: Disconnection and reconnection of Ausgrid cables at Beaconsfield Substation

Option Name: 1440 - Base Case

Option Assessment Name: 1440 - Base Case - Assessment 1

Rev Reset Period: Post (2023+)

Major Component	No.	Minor Component	Sel. Hazardous Event	LoC x CoF ($M)	Failure Mechanism	NoxLoC xCoF ($M)	PoF (Yr 1)	Total Risk ($M)	Risk ($M) (Rel)	Risk ($M) (Op)	Risk ($M) (Fin)	Risk ($M) (Peo)	Risk ($M) (Env)	Risk ($M) (Rep)
Cables 9SA and 92P	1	High Voltage Cable	Unplanned Outage - HV (Cables 9SA and 92P)	$258.86	Infrastructure Failure	$258.86	100.00%	$258.86	$257.76		$0.25			$0.85
				$258.86		$258.86		$258.86	$257.76		$0.25			$0.85

Total VCR Risk: $257.71 Total ENS Risk: $0.00

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