NEED/OPPORTUNITY STATEMENT (NOS)

Making the Grid Smarter - Albury Area Under-Voltage Load Shedding (UVLS)

NOS- 000000001535 revision 2.0

Ellipse project description:
TRIM file: [TRIM No]

Project reason: Network Capability Incentive Parameter Action Plan (NCIPAP)
Project category: Prescribed - NCIPAP

Approvals

Author	Thomas Peters	Senior Operations Planning Engineer
Reviewed	Jahan Peiris	Network Modelling & Performance Manager
	Hoang Tong	Operations Analysis Manager
Approved	Andrew Kingsmill	Manager/ Power System Analysis
Date submitted for approval	[Date]	

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 guideline[1] 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 scheme[2].

Jindera is a two transformer 330/132kV substation supplying:

- Essential Energy's substations at Albury (Union Rd), Corowa, Jelbart and Mulwala
- Norske Skog's paper mill at ANM
- Trustpower's hydroelectric power station at Hume

There is a high capacity (300 MVA) 132 kV ring (lines 99H-99Z-99B) connecting ANM and Albury to Jindera and lower capacity (140 MVA) alternate supplies from Wagga 330 to ANM (106 km line 996) and Finley to Albury (161 km line 997 and 9R4). The summated Essential Energy and Norske Skog load peaks at around 185 MW in winter and 200 MW in summer (see Figure 1).

During outages of a Jindera transformer or network elements that split the high-capacity ring, supply to Albury and ANM is made radial by opening the low capacity ties. This is done because:

- ANM cannot operate on 996 alone due to insufficient reactive support
- Even if the summated load was less than the capacity of the underlying network (approximately 160 MW) it cannot be permitted to operate like this because it is insecure for the next contingency.

2. Opportunity

Installation of under-voltage load shedding (UVLS) at Albury and ANM would enable the underlying 132 kV system to remain closed during the previously mentioned outages, reducing the amount of load at risk while maintaining system security. The schemes would be time-graded with the mill load shed first and then all load.

Immediately post fault it will remain very likely that Norske Skog's load will be shed but the higher value Essential Energy load may remain connected. During the recall phase, the presence of UVLS allows the 132 kV system to be loaded to its maximum capability but remain secure for the next contingency. Depending on Essential Energy load, this capacity may be utilised to restore partial load at ANM.

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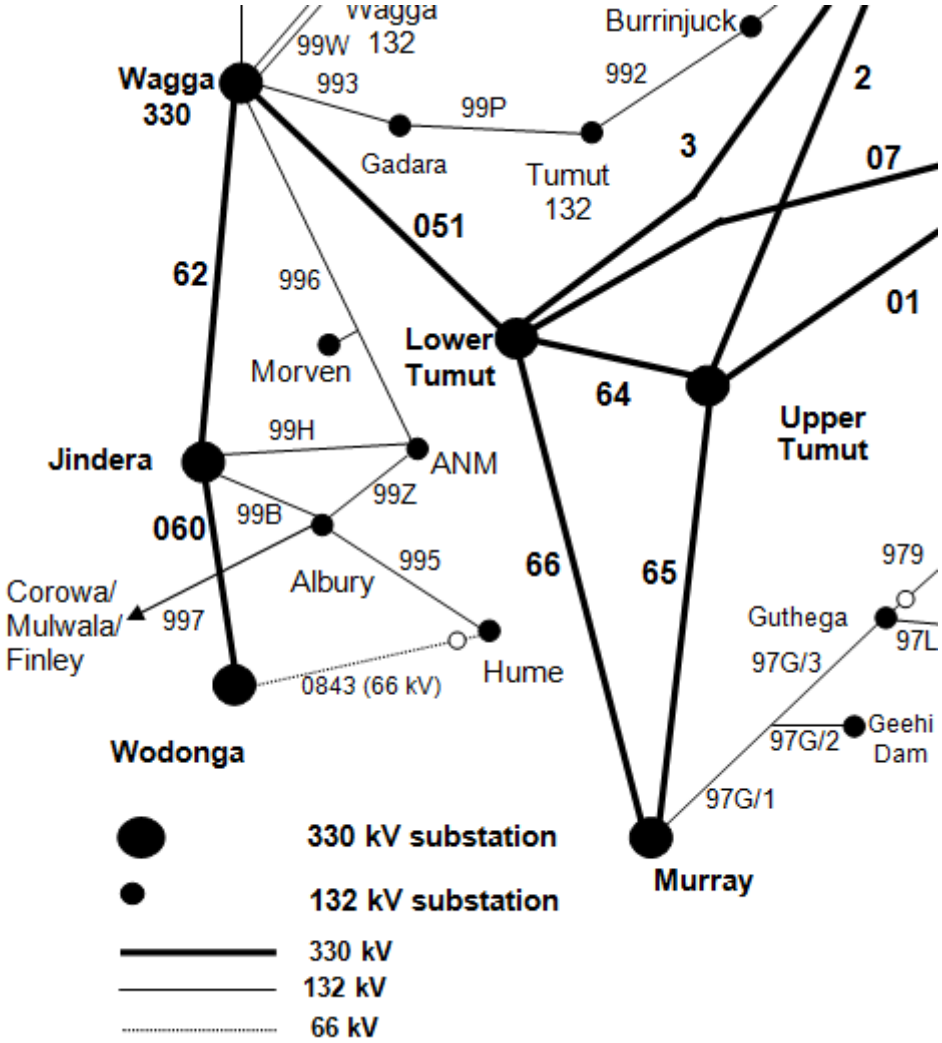
1 AER, Final Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme, Version 5 October 2015.

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

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

Option	Post contingency (tripped of radialised loads Albury or ANM) capacity
Do nothing with the prior outages of Jindera transformers, lines 99H or 99Z or 99B or 996 or 997.	0 MW at Albury and ANM
Installation of under-voltage load shedding (UVLS) at Albury and ANM	188 MW average load at Albury and ANM

Figure 1 – High Voltage Network Diagram of the Albury Supply Area



3. Related needs/opportunities

Nil.

4. Recommendation

It is recommended that under-voltage load shedding be installed at Albury and ANM so that critical Essential Energy load in the area can have reliable supply during local outages.

Attachment 1 Risk costs summary

Current Option Assessment - Risk Summary

Project Name: Albury Area UVLS scheme

Option Name: 1535 - Base Case

Option Assessment Name: 1535 - Base Case Option - Assessment 1

Rev Reset Period: Next (2018-23)

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)
CB-99B	2	Electrical	Unplanned Outage - HV (CB-99B)	$28.84	Failure	$57.68	0.07%	$0.04	$0.04		$0.00			$0.00
CB-99H	2	Electrical	Unplanned Outage - HV (CB-99H)	$28.84	Failure	$57.68	0.05%	$0.03	$0.03		$0.00			$0.00
Structure	1	Wooden Poles	Unplanned Outage - HV (Structure)	$28.84	Structural Failure	$28.84	0.02%	$0.01	$0.01		$0.00			$0.00
Structure 99H	1	Wooden Poles	Unplanned Outage - HV (Structure 99H)	$28.84	Structural Failure	$28.84	0.02%	$0.01	$0.01		$0.00			$0.00
				$115.36		$173.04		$0.08	$0.08		$0.00			$0.00

Total VCR Risk: $0.08 Total ENS Risk: $0.00

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