NEED/OPPORTUNITY STATEMENT (NOS)

TL Low Spans Stage2

NOS- 000000001556 revision 3.0

Ellipse project description: P0009031
TRIM file: [TRIM No]

Project reason: Capability - Improved Asset Management
Project category: Prescribed – Security/Compliance

Approvals

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Date submitted for approval	9 November 2017	

Change history

Revision	Date	Amendment
0	15 April 2016	Initial issue
1	20 October 2016	Update to 2016/17 dollars
2	25 November 2016	Update to format
3	9 November 2017	Update for revised risk costing

1. Background

Transmission lines are designed and constructed to achieve standard electrical clearances of the conductor at specific operating conditions. Australian Standard AS7000 for the Design of Overhead lines is the presently accepted industry design standard. This standard takes into account a range of safety and environmental factors including the expansion of the conductor due to heating (known as sag) and movement of the conductor due to strong winds (known as blowout). The minimum electrical clearances that should be achieved when the conductor reaches its maximum operating temperature is commonly referred to as the line design temperature.

Revised planning studies[1] performed in April 2016 determined the maximum foreseeable operating temperature of a number of transmission lines with known spans violating AS7000 minimum clearances (low spans).

These revised operating temperatures have been used to calculate the spans low spans which exist on the transmission lines studied. A risk assessment has been applied to determine which of these spans are expected to require remediation to mitigate the public safety risk they present to an acceptable level.

2. Need/Opportunity

The transmission lines identified in Table 1 have been found to have spans not complying with AS7000 at their expected operating temperatures. A risk assessment has been performed to identify the spans which present a higher risk to public safety (due to magnitude of violation and location of the violation) and the spans which present a lower risk to public safety.

Table 1 – Low Spans Stage 2

Line	From	To	Lower Risk Spans	Higher Risk Spans
61	Bannaby	Gullen Range	0	2
31	Regentville	Bayswater	0	0
L1	Tumut 3 PS	Lower Tumut	0	0
L3	Tumut 3 PS	Lower Tumut	0	0
L5	Tumut 3 PS	Lower Tumut	0	0
M9	Murray	Murray 1	1	1
62	Wagga 330	Jindera	1	2
3W	Kangaroo Valley	Capital Wind Farm	2	2
6	Capital Wind Farm	Canberra	0	1
33	Liddell	Bayswater	0	0
72	Wellington	Mt Piper	0	1
0X1	Red Cliffs	Buronga	0	2

[1] Low Spans Tower Lines – Nth Ctrl Sth – April 2016 Planning Study on PDGS

Line	From	To	Lower Risk Spans	Higher Risk Spans
X5/1	Balranald	Darlington Point	3	0
X5/3	Buronga	Balranald	3	0
66	Lower Tumut	Murray	14	6
65	Upper Tumut	Murray	6	10
64	Upper Tumut	Lower Tumut	1	1
20	Sydney North	Sydney West	2	1
29	Sydney West	Vineyard	0	0
27	Sydney East	Sydney North	1	0
30	Sydney West	Liverpool	0	4
X2	Buronga	Broken Hill	4	4
92	Vales Point	Newcastle	0	0
78	Sydney South	Ingleburn	0	0
94	Tomago	Newcastle	0	0
87	Armidale	Coffs Harbour	1	0
23	Munmorah	Vales Point	1	0
38	Sydney West	Regentville	0	0
37	Kemps Creek	Macarthur	0	2
9W	Tomago	Waratah West	0	0
Total			40	39

The risk cost associated with the issues identified in Table 1 is $0.53m per annum (refer Attachment 1).

In order to fulfil the requirements of the AS 5577 – Electricity Network Safety Management Systems, the public safety risk presented by the low spans must be reduced As Low As Reasonably Practical (ALARP).

3. Related Needs/Opportunities

- Need 1427: 20 330kV Transmission Line Renewal – Consideration should be given to combining the works in this need.
- Need 1408: 23 330kV Transmission Line Renewal – Consideration should be given to combining the works in this need.

4. Recommendation

It is recommended that options be considered to address the identified need/opportunity by 2023.

Attachment 1 - Risk Costs Summary

Summary of results is attached below. Refer to supporting document in PDGS for full risk assessment.

Current Option Assessment - Risk Summary

Project Name: 1556 Final submission

Option Name: 1556 - Base Case Final submission

Option Assessment Name: 1556 - Base case final - 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)
Conductor - Higher Risk	39	Conductor	Uncontrolled Electrical Contact / Discharge (Conductor - Higher Risk)	$0.32	Low Span	$12.51	4.11%	$0.51	$0.19		$0.01	$0.31		$0.00
Conductor - Lower Risk	40	Conductor	Uncontrolled Electrical Contact / Discharge (Conductor - Lower Risk)	$0.27	Low Span	$10.87	0.10%	$0.01	$0.00		$0.00	$0.01		$0.00
				$0.59		$23.39		$0.53	$0.20		$0.01	$0.31		$0.00

Total VCR Risk: $0.20

Number of Components

The number of components used in the Risk costs summary model has been derived as follows:

> Higher risk low spans: The number of low spans identified in Table 1 (39).

> Lower risk low spans: The number of low spans identified in Table 1 (40).

Probability of Failure

As per the Risk costs summary model

Consequence of Failure

As per the Risk costs summary model