

NEED/OPPORTUNITY STATEMENT (NOS)



Liverpool 415V AC Dist Replacement

NOS- 000000001519 revision 3.0

Ellipse project no.: P0008778

TRIM file: [TRIM No]

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

Project category: Prescribed - Replacement

Approvals

Author	Mark Jones	Secondary Systems and Communications Asset Manager
Endorsed	Mark Jones	Secondary Systems and Communications Asset Manager
Approved	Lance Wee	M/Asset Strategy
Date submitted for approval	16 November 2016	

Change history

Revision	Date	Amendment
0	9 June 2016	Initial issue
1	26 October 2016	Update to 2016/17 dollars
2	16 November 2016	Update to format

1. Background

Liverpool Substation was constructed in 1985. It is an important point of interconnection for TransGrid's 330kV network and connects to Endeavour Energy at 132kV to supply the Sydney Metropolitan South West area.

TransGrid has experienced an increase in the number of safety incidents related to the 415V AC systems across all substation sites over the past two years. The investigation into these incidents has highlighted the poor condition of aging 415V AC distribution infrastructure as a major contributing factor to these incidents. A project was initiated to identify all defects on the 415V systems across the network and Liverpool was identified as one of the sites with a high concentration of defects.

The 415V AC distribution at Liverpool Substation powers all non-critical systems at the site including GPOs, lighting, air conditioners, security and transformer cooling. It will remain an integral component of a substation site for the foreseeable future.

2. Need/opportunity

TransGrid is currently managing the defects on its 415V AC distribution systems that were identified as the highest risk to safety through a mixture of corrective maintenance and changes to work practices. However, these measures are not addressing the structural deficiencies in the infrastructure and a more holistic approach to bring systems up to current requirements as per AS3000 will likely achieve better safety outcomes.

Liverpool site has 3.6% of all 415V AC distribution defects across the network. The original system will be over 40 years old by 2023.

The risk cost associated with the 415V distribution system at Liverpool Substation is \$1.26m per annum. The most significant element of concern is the reliability consequence associated with an unplanned outage of a primary asset due to malfunction of the 415V AC distribution. The risk costs are based on 2015/16 probabilities of failure as extrapolated from the 415V Safety Survey conducted in 2015.

3. Related needs/opportunities

Nil

4. Recommendation

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

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: Liverpool 330kV 415 AC Distribution Replacement

Option Name: 1519 - Base Case

Option Assessment Name: 1519 - Base Case - 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)
Low Voltage AC Supply	1	AC Low Voltage Board/Panel/Box	Uncontrolled Electrical Contact / Discharge (Low Voltage AC Supply)	\$4.82	Failure	\$4.82	3.59%	\$0.17	\$0.14	\$0.03	\$0.03			\$0.00
Low Voltage AC Supply	1	AC Low Voltage Board/Panel/Box	Unplanned Outage - HV (Low Voltage AC Supply)	\$12.72	Failure	\$12.72	3.59%	\$0.46	\$0.43	\$0.03	\$0.03			\$0.00
Low Voltage AC Supply	1	AC Low Voltage Cable	Uncontrolled Electrical Contact / Discharge (Low Voltage AC Supply)	\$4.82	Failure	\$4.82	3.59%	\$0.17	\$0.14	\$0.03	\$0.03			\$0.00
Low Voltage AC Supply	1	AC Low Voltage Cable	Unplanned Outage - HV (Low Voltage AC Supply)	\$12.72	Failure	\$12.72	3.59%	\$0.46	\$0.43	\$0.03	\$0.03			\$0.00
								\$35.08	\$35.08	\$1.14	\$0.12			\$0.00

Total VCR Risk: \$1.13 Total ENS Risk: \$0.00