

NEED/OPPORTUNITY STATEMENT (NOS)



Lismore SVC Replacement

NOS- 000000001287 revision 2.0

Ellipse project no.: P0005907

TRIM file: [TRIM No]

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

Project category: Prescribed - Replacement

Approvals

Author	A. Welvaert	Secondary Systems Analyst
Endorsed	M. Jones	Secondary Systems and Communications Asset Manager
Approved	L. Wee	M/Asset Strategy
Date submitted for approval	9 November 2016	

Change history

Revision	Date	Amendment
0	6 June 2016	Initial issue
1	11 October 2016	Update to 2016/17 dollars
2	9 November 2016	Update to format

1. Background

The Static Var Compensator (SVC) at Lismore Substation has been in service since 1999. According to the Substations Renewal and Maintenance Strategy¹, SVCs have a nominal life of 20 years, which means that it will exceed its nominal lifetime by 2023.

Lismore substation is a critical point of supply to the NSW Far North Coast Region and the SVC at Lismore is required in order to:

- > Regulate and control the Lismore 330kV voltage to the required set point under normal steady-state and contingency conditions;
- > Provide dynamic, fast response reactive power following system contingencies;
- > Enhance damping of system magnetic oscillations by controlling the frequency oscillations in the 330kV systems.

The control system design and equipment used for the SVC at Lismore is not used elsewhere in TransGrid and is based on analogue generation components. Current generation control systems are digital.

Due to the difference in the SVC design at Lismore, the ongoing support of the control system and access to spare parts is limited. TransGrid is unlikely to be able to recover from a failure of the SVC control system, SVC thyristors or associated cooling plant. This means that a full replacement would be required upon failure, leaving the SVC crippled or inoperable for a period potentially up to 18 months. The SVC is located at a critical point of supply there is a need to ensure that the reactive power supply remains available.

2. Need/opportunity

This need covers the replacement of the complete control and protection system for the SVC at Lismore substation.

The risk cost associated with all assets in the SVC installation at Lismore is \$3.4m per annum. This risk is based on the cost of market impacts and energy not served due to the failure of the SVC or cooling plant, as well as the increased replacement costs to accelerate the recovery. The risk costs have been modelled for 2015/16 based on historical probabilities of failure.

3. Related needs/opportunities

NIL

4. Recommendation

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

¹ Refer Substations Renewal and Maintenance Strategy, pg 77

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: Lismore SVC Replacement

Option Name: 1287 - Base Case

Option Assessment Name: 1287 - Preferred 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) (Pee)	Risk (\$M) (Env)	Risk (\$M) (Rep)
SVC	1	Cooling System	Unplanned Outage - HV (SVC)	\$13.21	Failure	\$13.21	12.90%	\$1.70	\$0.15	\$0.15	\$1.56			\$0.00
SVC	1	SVC	Unplanned Outage - HV (SVC)	\$13.21	Failure	\$13.21	12.90%	\$1.70	\$0.15	\$0.15	\$1.56			\$0.00
								\$3.41	\$0.29	\$3.11			\$0.00	

Total VCR Risk: \$0.27 Total ENS Risk: \$0.03