

NEED/OPPORTUNITY STATEMENT (NOS)



Substation Based PC Condition

NOS- 000000001375 revision 3.0

Ellipse project no: P0008016

TRIM file: [TRIM No]

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

Project category: Prescribed - Asset Renewal Strategies

Approvals

Author	Adam Hoare	Secondary Systems Senior Analyst
Endorsed	Mark Jones	Secondary Systems and Communications Asset Manager
Approved	Lance Wee	M/Asset Strategy
Date submitted for approval	17 November 2016	

Change history

Revision	Date	Amendment
0	23 June 2016	Initial issue
1	17 October 2016	Update to 2016/17 dollars
2	17 November 2016	Update to format

1. Background

TransGrid currently utilises substation based PCs across the network in order to perform various miscellaneous control based functions. Generically these PCs provide Human Machine Interface (HMI), Condition Monitoring (CM) and Data Concentrator (DCON) capabilities within the substation.

The use of substation based PCs provide core automation functions within a substation, including the ability of remote visibility, alarm monitoring and switchgear operability from the TransGrid Control Centre. As such these devices will be required into the foreseeable future.

2. Need/opportunity

The assets investigated under this need are microprocessor based PCs that have reached their end of life and are in need of replacement. Except for substations with redundant DCONs installed, all other site PCs are not duplicated and a single failure will result in a loss of that particular control function.

The following relay models are covered by this need:

PC Model	Primary Function	Quantity Installed
ICP RACK-305	DCON (VmHost)	33
Various	HMI / CM / Other	130

The risk cost associated with substation based PCs is \$2.92m per annum. The most significant element of concern is the reliability consequence associated with an unplanned outage caused by the failure of the Data Concentrators and inadvertent operation of a feeder circuit breaker. Substation PCs are installed at all voltage levels within the TransGrid network. It is estimated that 8 hours would be required to recover any loss of load after a DCON failure and inadvertent operation. The risk costs are based on 2015/16 probabilities of failure derived from the latest Telecommunications & Control Defect List¹. These probabilities are forecast to continue increasing over the coming years as the assets continue past their expected life.

3. Related needs/opportunities

NIL.

4. Recommendation

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

¹ Refer SSA - Assessments - Technical Performance - Telecommunications and Control - Defects

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: Substation Based PC Condition

Option Name: 1375 - Base Case

Option Assessment Name: 1375 - 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)
Controls - Other PCs	0	Bay Controller	Unplanned Outage - HV (Controls - Other PCs)	\$0.00	Failure	\$0.00								
Controls - Other PCs	0	Control Cabling	Unplanned Outage - HV (Controls - Other PCs)	\$0.00	Failure	\$0.00								
Controls - Other PCs	130	Data Concentrator	Unplanned Outage - Comms (Controls - Other PCs)	\$0.01	Failure	\$1.30	16.90%	\$0.22	\$0.00	\$0.00	\$0.22			\$0.00
Controls - VmHosts	0	Bay Controller	Unplanned Outage - HV (Controls - VmHosts)	\$0.00	Failure	\$0.00								
Controls - VmHosts	0	Control Cabling	Unplanned Outage - HV (Controls - VmHosts)	\$0.00	Failure	\$0.00								
Controls - VmHosts	33	Data Concentrator	Unplanned Outage - Comms (Controls - VmHosts)	\$0.48	Failure	\$15.99	16.90%	\$2.70	\$2.63	\$0.07	\$0.07			\$0.00
				\$0.49		\$17.29		\$2.92	\$2.63		\$0.29			\$0.00

Total VCR Risk: \$2.63 Total ENS Risk: \$0.00