

NEED/OPPORTUNITY STATEMENT (NOS)



Substation Capital Spares

NOS- 000000001457 revision 1.0

Ellipse project no.: P008480

TRIM file: [TRIM No]

Project reason: Capability - Improved Asset Management

Project category: Prescribed - Asset Renewal Strategies

Approvals

Author	Adam Ramsay	Consultant (Jacobs)
Endorsed	Evan Lamplough	Substations Asset Strategist
	Ken Burton	Engineering Officer / Asset Strategy
	Robert Li	Substations Asset Strategist
	Tony Gray	Substations Asset Manager
Approved	Lance Wee	Manager / Asset Strategy
Date submitted for approval	23 November 2016	

Change history

Revision	Date	Amendment
0	11 April 2016	Initial issue
1	23 November 2016	Update to format

1. Background

Capital Spares are recorded and valued within TransGrid's financial systems. Plant items such as circuit breakers, auxiliary transformers, current transformers, voltage transformers or major components of plant such as bushings, circuit breaker interrupters and poles may be classified as capital spares.

There is a need to provide funding to cover capital spares purchases that are anticipated to be required over the 2019-2023 regulatory period.

2. Need/opportunity

The Substation Spares Policy (D2006/05490) provides guidance in the establishment of spare components and appropriate minimum spare equipment requirements for substations, which allows response to credible equipment failure scenarios. This policy excludes provision of spare power transformers, which is covered by the Spare Power Transformer Policy (D2003/2310).

The substation spares policy has been developed to provide a minimum level of substation spares to allow response to equipment failure over the expected life of the equipment. The levels chosen balance factors such as:

- > Substation component criticality.
- > Numbers of a particular plant item.
- > The likelihood of failure of particular equipment components.
- > Minimising stores inventory and upfront cost.
- > The possibility/feasibility of component part repair.
- > The need to support the equipment over a life of around 40 years, recognising that parts are cheaper when plant is originally purchased and may not be even available near end of life.

Due to the renewal of plant purchasing contracts and due to the normal changes in equipment design that occurs through design evolution, there is an anticipated need to procure additional capital spare components during the 2019-2023 regulatory period. The requirement can be estimated based on normal renewal cycles and expected major projects and normal plant replacement.

3. Related needs/opportunities

The VT renewal program for the 2019-23 period (Need 1442) may also recommend the purchase of spare CVTs as the preferred option for managing with the risk of CVT failures. The CVTs recommended under the VT renewal program will be in addition to the spares which are recommended under this need.

4. Recommendation

It is recommended that the required capital spares identified in Attachment 2 be procured in accordance with the current policy.

Attachment 1 - Factors Affecting Minimum Spares Levels

Factor	Discussion
Impact of Failure	Failures affecting supply require a speedy response. Equipment in critical locations may require additional spares.
Frequency of Failure or Maintenance Replacement	Parts requiring frequent replacement may require additional inventory to meet demand.
Availability From Suppliers	Equipment with long lead times may not be supported for their expected lifetime. Additional inventory may be required where equipment is de-supported or other strategies initiated, such as modification or replacement.
Availability from Projects	High value or fast moving items need not be maintained in stores to cover failures where it may be efficient to use project material, even if this requires projects to be deferred (eg whole circuit breaker)
Lead Time for Spares	Spares with long lead times may need additional inventory to meet demand. Conversely, off-the-shelf parts may be purchased as required.
Repair Options	On-site or workshop based repair options may be appropriate for equipment with redundancy. Also, repairable parts may have a significantly shorter repair time than purchase lead time.
Storage Requirements	Parts with limited shelf life or difficult storage requirements, may need to be managed with a different strategy.
Population	Equipment population can affect the frequency of failure.
Alternate Solutions	<p>Direct replacements may not be practical in all cases. Some examples of alternate solutions may be:</p> <ul style="list-style-type: none">> Replacement with equivalent plant may be appropriate.> Plant may also be identified in spare bays or non-critical circuits for use in emergencies.> Relying on supplier support may be appropriate

Attachment 2 - Summary of required spares

Equipment	2018/19	2019/20	2020/21	2021/22	2022/23
Bushing 500kV	1				1
Bushing 330kV		2			1
Bushing 132kV	2			2	
Bushing Wall 330kV			1		
Bushing Wall 132kV					1
CB 500kV Interrupter/Pole		1			1
CB 330kV Interrupter/Pole		1			1
CB 132kV Interrupter/Pole		1			1
CB 66kV Interrupter/Pole		1			1
DTCB 330kV Interrupter	1		1		1
DTCB 132kV Interrupter			1		1
DTCB 66kV Interrupter			1		1
Current Transformer 500kV				3	
Current Transformer 330kV	3			3	
Current Transformer 132kV		3			3
Current Transformer 66kV	3			3	
CVT 500kV	1		1		1
CVT 330kV		3			3
CVT 220kV					
CVT 132kV			2		2
MVT 330kV			1		1
MVT 132kV			2		2
Aux Transformer 11kV,500/1000kVA					1
Condition Monitoring Devices (Bushing Monitors)	1	1	1	1	1
Condition Monitoring Devices (Circuit Breaker Monitors)	1	1	1	1	1
Condition Monitoring Devices (Tx & Rx gas/moisture in oil monitor)		1		1	

Equipment	2018/19	2019/20	2020/21	2021/22	2022/23
Condition Monitoring Devices (Network Switches)	1		1		1