OPTIONS EVALUATION REPORT (OER)

FY24-28 DI Capital Spares

OER- N2555 revision 0.0

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Approvals

Author	Anh Diep	Digital Infrastructure Asset Engineer
Endorsed	Debashis Dutta	Asset Analytics & Insights Manager
	Adam Hoare	Digital Infrastructure Asset Manager
Approved	Lance Wee	Head of Asset Management
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Change history

Revision	Date	Amendment
0	14/10/2021	First Issue

Executive summary

Spare assets are required to enable the effective restoration of equipment following failure. Spares requirements are documented in TransGrid's Spares Policy (all asset streams) and Digital Infrastructure (DI) spares requirements are specified in the DI Spares Plan. The Spares Plan determines spares holdings to minimise total cost whilst maintaining a critical level deemed appropriate to ensure network reliability and security risks are managed effectively.

Capital Spare is a financial classification of a critical spare which meets the criteria specified within TransGrid's Expenditure Capitalisation procedure. These items usually have a significant lead time to procure. Generally, DI items that meet the capital spares criteria include protection relays, monitoring equipment, battery chargers, and CCTV cameras.

Capital spares will be required in the next regulatory period (2023/24-2027/28) to replenish current spares holdings as they are consumed due to expected asset failures. An allowance is also required to support new asset types installed into the network in this period.

It is forecast that 110 DI capital spares will require purchasing in the 2023/24-2027/28 Regulatory Period.

The assessment of the options considered to address the need/opportunity appears in **Error! Not a valid bookmark self-reference.**. An NPV is not calculated for this investment. Additional capital spares are required to comply with the DI Spares Plan.

Table 1 - Evaluated options-Summary

Option	Description	Direct capital cost ($m)	Network and corporate overheads ($m)	Total capital cost[1] ($m)	Weighted NPV (PV, $m)	Rank
Option A	Replenish capital spares	2.02	Nil	2.02	N/A	1

It is recommended to proceed with allowance of $2.02 million for DI capital spares, as specified in Option A. This will enable TransGrid to continue to meet the requirements of the Spares Policy and the DI Spares Plan. In doing so, the risk of network interruption is minimised as critical failures can be responded to effectively.

[1] Total capital cost is the sum of the direct capital cost and network and corporate overheads. Total capital cost is used in this OER for all analysis.

1. Need/opportunity

The Digital Infrastructure (DI) Spares Plan determines spares holdings to minimise total cost whilst maintaining a critical level deemed appropriate to ensure network reliability and security risks are managed effectively. Capital Spare is a financial classification of a critical spare which meets meet the criteria specified within TransGrid's Expenditure Capitalisation procedure. These items usually have a significant lead time to procure. Generally, Digital Infrastructure spares with a value of greater than $10,000 are categorised as Capital Spares. Items that meet this criteria are typically the following:

- Microprocessor based protection relays (or IEDs)
- Monitoring equipment such as fault recorders.
- CCTV equipment such as cameras
- Battery chargers and rectifiers

There is an ongoing need to replenish spares as they are consumed to replace assets that fail. A lack of spares availability potentially poses a temporary but significant increase in reliability risk, particularly in the event of protection system failures. Moreover, the Network Performance Requirements, set out in Schedule 5.1 of the NER, place an obligation on TNSPs to provide redundant protection schemes to ensure the transmission system is adequately protected. TransGrid may not be able to meet this requirement if critical spares such as protection relays are not available in the event of a failure.

The required spares levels take into account various factors including:

- Population of the item on the network
- Failure rates of the associated assets in the network
- Lead time for acquiring new stock
- Life-cycle status of the item i.e. availability of purchasing spares

To continue effective management of equipment, appropriate capital spares will need to be purchased over the 2024–2028 regulatory period in accordance with the DI Spares Plan. The capital spares program will also cater for spares required for new items being installed on TransGrid's network.

2. Related needs/opportunities

N/A

3. Options

3.1 Base case

The Base Case for this need involves no future purchase of capital spares. This approach does not address the following issues:

- Inability to meet the requirements of the Spares Policy and the DI Spares Plan.
- Failure of equipment and delay in the restoration due to the non-availability of spares can lead to unreliable protection of network assets
- Risk of non-compliance with Network Performance Requirements if critical spares such as protection relays are not available in the event of a failure, leading to forced network interruptions.

Moreover, this approach is not consistent with asset management best practices.

3.2 Options evaluated

Option A — Replenish capital spares [NOSA N2555, OFS N2555A]

This option allows for the purchase of appropriate capital spares to meet requirement of this need. Spares requirements are documented in TransGrid's Spares Policy and the DI Spares Plan.

Capital spares requirement for next regulatory period (2024-2028) are estimated based on following:

- Forecast number of unplanned replacements based on historical asset failure data.
- Spares required based on identification of gaps in holdings based on ongoing spares analysis and data improvements.
- New spares required to support new asset types installed on the network.

It is forecast that 110 DI capital spares will require purchasing in the 2023/24-2027/28 Regulatory Period. This is summarised in Appendix A.

This option will enable TransGrid to continue to meet the requirements of the Spares Policy and the DI Spares Plan. In doing so, the risk of network interruption is minimised as critical failures can be responded to effectively. Moreover, sufficient availability of spares will ultimately enable TransGrid to better maintain compliance with NER requirements.

3.3 Options considered and not progressed

Table 2 - Option considered but not progressed

Option	Reason for not progressing
Purchase under OPEX	This option is not technically feasible as the relevant items under this Need meet the Capital Spares criteria set down in the Expenditure Capitalisation procedure. Hence, the items are expected to be capitalised and cannot be accounted for under OPEX.

4. Evaluation

The Spares Policy and DI Spares Plan provides guidelines in establishing appropriate minimum spares requirements for TransGrid to provide a network that meets the required reliability standards. Option A is the only option that meets the requirements of the Spares Policy. Hence, a commercial evaluation has not been carried out as the need is compliance driven.

Based on the feasibility studies, it is estimated that the procurement of DI capital spares for the 2024–2028 period will cost $2.02 million as summarised in Appendix A.

4.1 ALARP evaluation

TransGrid manages and mitigates bushfire and safety risk to ensure they are below risk tolerance levels or 'As Low As Reasonably Practicable' ('ALARP'), in accordance with the regulation obligations and TransGrid's business risk appetite. However, an ALARP evaluation is not applicable in this case as the need relates to the restoration of assets after failure which does not have a quantified safety risk cost.

4.2 Preferred option

The preferred option to meet the identified need by is Option A. Option A is the only option which meets the requirements of the DI Spares Plan. It will also enable TransGrid to continue maintaining compliance with NER requirements as well as minimise market impacts by ensuring that adequate Capital Spares are available to address critical secondary system failures.

Capital and Operating Expenditure

There are no capex to opex trade-offs considered in this evaluation.

Regulatory Investment Test

The program and estimate allows for the appropriate Regulatory approvals as required.

5. Recommendation

It is recommended to provide an allowance of $2.02 million in the 2023/24-2027/28 Regulatory Period for purchasing DI Capital Spares, as specified under Option A.

Appendix A – Forecast Capital Spares Requirements

The DI Capital Spares requirements forecasted for the 2024–2028 Regulatory Period are summarised in the table below.

Table 3 DI capital spare item list

Item	Forecasted Quantities	OFS Unit Costing ($)	Total Estimate ($)
Protection Relay, RED670/9	6	$18,379	$110,274
Protection Relay, REC670/10	4	$16,374	$65,496
Protection Relay, RED670	9	$17,721	$212,652
Protection Relay, RET670	2	$ 10,995	$21,990
Protection Relay, B90/3[2]	1	$13,787	$13,787
Protection Relay, D60/2[3]	10	$14,498	$144,980
Protection Relay, T60	13	$12,812	$166,556
Protection Relay, P442	13	$ 14,647	$190,411
Protection Relay, P546	4	$16,806	$67,224
Protection Relay, SEL-421	11	$13,197	$145,167
Control AVR, REC670	4	$14,944	$59,776
Control (Miscellaneous), REC670/7	2	$11,711	$23,422
Monitoring (Fault Recorder), IDM	10	$32,500	$325,000
Monitoring (Quality of Supply), UP-2210R	4	$22,150	$88,600
Monitoring (Fault Locator), TWS	4	$32,874	$131,496
Battery Charger 110V, NiCd	2	$16,288	$32,576
Battery Charger 50V, RPS	2	$19,650	$39,300
CCTV Camera, PTZ Thermal	6	$29,588	$177,528
Total			**$2,016,235**