

Engineering Justification Paper – SPT-RI-213 New Cumnock SGT2B				
Name of Scheme/Programme	SPT-RI-213 New Cumnock SGT2B			
Primary Investment Driver	Load			
Scheme reference/mechanism or category	SPT20043/44 Generation Connections			
Output references/type	LRT2SP2018			
Cost	£8.56			
Delivery Year	2022			
Reporting Table	B0.7 Load Master Data B4.2a Scheme Summary B4.5 Scheme Asset Data B4.5a Scheme Asset Data			
Outputs included in RIIO T1 Business Plan	No			
Spend apportionment	Scheme	T1	T2	T3
	SPT20043/44	£1.80m	£6.77m	£0m

Issue Date	Issue No	Amendment Details
December 2019	Issue 1	First issue of document

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1 Introduction

Due to the amount of currently contracted and new generation, New Cumnock 132kV collector substation has reached its capacity and fault level design limits. It is therefore necessary to mitigate the fault level and provide additional capacity in order to facilitate new generation connections to the 132kV network in South West Scotland. The works associated with this project will be completed by 2022.

This paper justifies the installation of a third transformer for New Cumnock 132kV Board B to increase the total capacity.

2 Background Information

New Cumnock 275/132kV substation comprises of a single 275kV busbar with six 275/132kV 240MVA transformers connected to two separate 132kV boards: Board A and Board B. Three transformers (SGT1A, SGT2A and SGT3A) are connected to a wraparound 132kV board (Board A), two transformers (SGT2B and SGT3B) are connected to a single 132kV busbar (Board B) and the sixth transformer (SGT1B) is connected to the New Cumnock – Kendoon circuit. This gives a total capacity of 720MVA for Board A, 480MVA for Board B and 240MVA for the Kendoon circuit. Table 1 shows the contracted generation into New Cumnock Board B including power flow from Kendoon 132kV substation. New Cumnock 132kV Board A will be separated to establish Board A and Board C, and two 360MVA 275/132kV transformers will be installed on Board C, as detailed in TORI 158¹. As can be seen from Table 1, the total generation of 558.4MW has exceeded the 480MVA capacity of the two 275/132kV transformers at New Cumnock Board B.

Table 1. New Cumnock Board B Contracted Generation

Developer	Status	Board B (MW)
Benbrack and Quantans Hill Wind Farm	Contracted	72
Blackcraig	Contracted	52.9
Longburn	Contracted	49.5
Lorg	Contracted	45
Torrs Hill	Contracted	28
Kendoon Circuit	Connected	311
Total		558.4

3 Detailed Analysis

The following options were considered:

	Option	Status	Reason for rejection
1	Do nothing	Rejected	Does not comply with legal and licence obligations
2	Install a third 275/132kV 240MVA transformer at New Cumnock Board B	Proposed	

¹ See EJP_SPT_SPT20021

Option 1 does not comply with SPT’s obligation to provide sufficient capacity for new generation, and therefore is not a true alternative for this project. This leaves Option 2 as the preferred method. The works proposed as part of Option 2 are shown schematically in Figure 1 (together with the new Board A and Board C configuration).

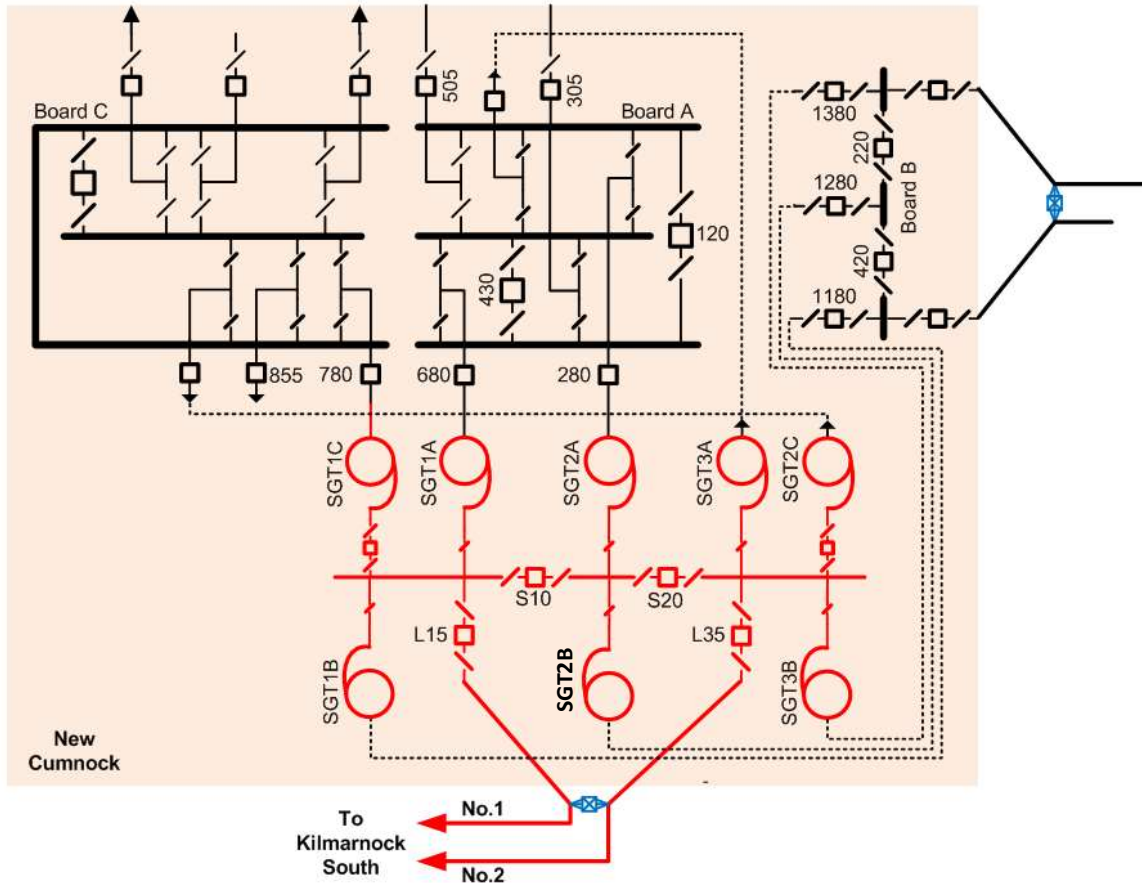


Figure 1. Schematic of the Proposed New Cumnock Substation

Under Option 2, a third 240MVA 275/132kV transformer (SGT2B) is to be installed at New Cumnock 132kV Board B, giving Board B a total capacity of 720MVA and a firm capacity of 480MVA. The existing two 240MVA transformers (SGT1B and SGT3B) will remain connected on Board B. The total cost associated with the installation of the new transformer is £8.56m.

4 Future Pathways – Net Zero

Primary Economic Driver

The primary driver for investment for the proposed works is to create network capacity for the provision of generation connections.

Payback Periods

A CBA has not been undertaken for the proposed scheme and a payback period has not been assessed.

Pathways and End Points

The proposed solution facilitates the connection of additional wind generation. This enables the connection of generation and the operation of a network with high wind penetration, facilitating the path to Net Zero.

Asset Stranding Risks

The risk of asset stranding is considered to be very low.

Sensitivity to Carbon Prices

The main sensitivity is likely to be as a result of further generation which could emerge and require further upgrades.

Future Asset Utilisation

The utilisation of the proposed assets is likely to increase as renewables continue to connect to the network. Note that projected maximum power flow for Board B will still exceed its firm capacity, ensuring high utilisation of the assets.

Whole Systems Benefits

These works facilitate the connection of generation, contributing carbon reduction across the system.

5 Conclusion

In order to facilitate the connection of new generation at New Cumnock 132kV Board B and to mitigate the fault levels associated with an increase in generation, it is proposed to install a third 240MVA 275/132kV transformer (SGT2B) in addition to the existing two (SGT1B and SGT3B). This will increase the capacity of the switchboard to 720MVA and the non-firm capacity to 480MVA. Works will be completed by 2022 and will have a total cost of £8.56m.

6 Outputs included in RIIO T1 Plans

No outputs are included in RIIO-T1 plans.