Adding 220kV Equipment to the Codes

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Introduction

History

GSR0021 was raised in 2015 to look at reviewing incorporating 220kV transmission assets into the SQSS.

This was subsequently rejected by Ofgem as it did not offer a solution to further nominal voltages potentially requiring review and addition to both the SQSS and the network.

Future proof- additional equip
Not urgent no customers- limited potential

Decision Letter from Ofgem
GSR0021 Industry Consultation Paper

Proposal

Raise a new modification in response to Ofgem's decision letter dated July 2016.

The objective of this modification will be to capture any future equipment with varying nominal voltages – therefore avoiding frequent amendments to the SQSS and also the Grid Code. The aim will be to do this using defined terms where possible and creating a table of voltages similar to that in the EU codes in both the SQSS and the Grid Code.

Where are these cables?

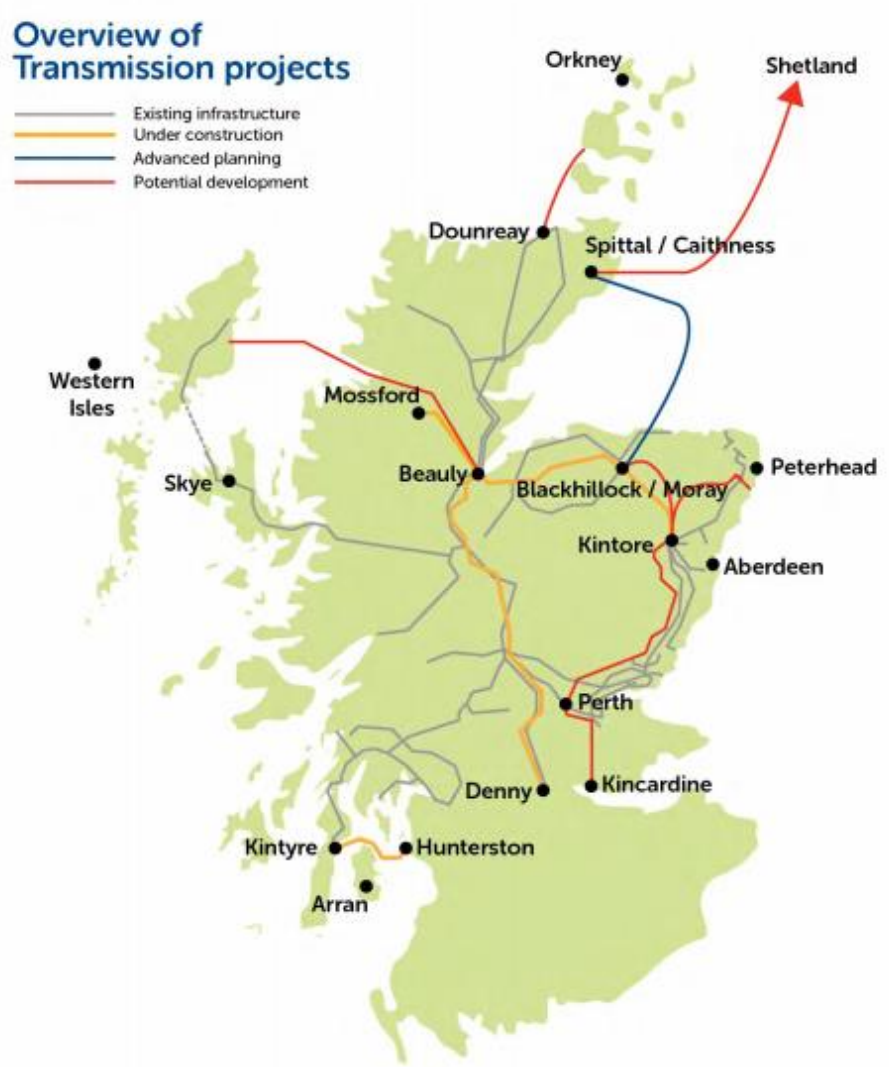
Current Locations

The Kintyre-Hunterston subsea AC link has two subsea cables between Crossaig on the Kintyre peninsula and Hunterston.

These are connected to the Onshore Transmission System via two 400/220kV supergrid transformers at Hunterston and via two 220/132 kV transformers at Crossaig.

Future

220kV is common EU transmission voltage. It is possible that further equipment of other common voltages (Eg: 380kV, 110kV) could be connected to the GB system in the future.



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Why should we review?

Clarity of Requirements

- Unclear what specification or performance is required from equipment at voltages not currently specified within the codes.

Consistency

- SQSS and Grid Code need to be aligned.

Specification

- In including specifications for equipment at voltage not currently covered by the codes.

What Areas of Code are to be Reviewed?

Section of SQSS	SQSS Reference Points
Voltage Limits in Planning and Operating the Onshore Transmission System	Tables 6.1, 6.2, 6.3 and 6.4
Terms and Conditions	Supergrid Definition

Section of the Grid Code	Grid Code Reference Points
Single Point of Connection	PC.A.8.1 and PC.A.8.3
Grid Voltage Variations	CC.6.1.4
Fault Clearance	CC.6.2.2.2.2 and CC.6.2.3.1.1
General Generating Unit	CC.6.3.2 and CC.6.3.4
Steady State Voltage	CC.A.7.2.2.1.2.4
Reactive Capability Table	CC.6.3.2

Current Version

Table 6.1 Pre-Fault Steady State Voltage Limits and Requirements in Planning Timescales

(a) Voltage Limits on Transmission Networks		
Nominal Voltage	Minimum (***Note 1***)	Maximum
400kV	390kV (97.5%)	410kV (102.5%) ***Note 2***
275kV	261kV (95%)	289kV (105%)
132kV	125kV (95%)	139kV (105%)
(b) Voltages to be Achievable at Interfaces to Distribution Networks		
Nominal Voltage		
Any	105% at forecast *Group Demand*; 100% at *forecast Minimum Demand*, or as otherwise agreed with the relevant Network Operator	

Notes

1. It is permissible to relax these to the limits specified in Table 6.2 if:
   (i) following a *secured event*, the voltage limits specified in Table 6.2 can be achieved, and
   (ii) there is judged to be sufficient certainty of meeting Security and Quality of Supply Standards in operational timescales.
2. It is permissible to relax this to 420kV (105%) if there is judged to be sufficient certainty that the limit of 420kV (105%) can be met in operational timescales.

Proposed New Version (Example)

(a) Voltage Limits on Transmission Networks		
Nominal Voltage	Pu	Normal Operating Range
>300- 400kV	0.95pu-1.05pu***	+/_ 5%
>200kV-300kV	0.90pu-1.10pu**	+/_ 10%
<200kV	0.90pu-1.10pu*	+/_ 10%
(b) Voltages to be Achievable at Interfaces to Distribution Networks.		
Nominal Voltage		
Any	Target voltages and voltage ranges as agreed with the relevant Distribution Network Operators, within the limits of Table 6.4	