SP ENERGY NETWORKS

Network Planning & Regulation

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Date:
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Dear Geoff

Proposal for amendment to SP Transmission special licence condition (SLC) 6F

This letter presents a proposal to amend licence condition 6F as part of the mid period review parallel work stream on improvements to the RIIO-T1 framework. It presents an explanation of the background and the drivers which have led to the need for an amendment to this licence, and an overview of the changes we are proposing. The scope of this letter is limited to demonstrating the need for a licence change. A second stage submission with more detailed analysis supporting the proposed changes can be prepared following discussion and feedback from Ofgem on this proposal.

Overview

SLC6F covers the arrangements for funding sole use and shared use infrastructure to connect new generation connections to our network. The scope and scale of the required investment is therefore driven by the volume and location of generation applications that are contracted. The level of shared use infrastructure has changed from a best view position of 1073MVA at the time of our RIIO-T1 submission to a current forecast to deliver an output of 4229MVA by the end of the period. This requires a forecast increase in expenditure of £389m compared to our RIIO-T1 baseline of £112m.

Reasons for the Change in Output

At the time of our submission we forecast that over the course of RII0-T1 we would connect around 2.5GW of additional generation capacity, although approximately 1GW of this was expected to be subject to substitution of projects from those that comprised our best view. Currently, over 3.5GW is contracted to connect by 2021 and this is leading to the scale of change in shared use reinforcement although this is increased due to the localisation of the generation in certain areas.

Consumer Benefit

The technically justified and cost-efficient design solutions that we have developed to reinforce our network to enable connection of new generation has led to innovative solutions to upgrade existing infrastructure. This provides a more economic and quicker connection compared to new build assets.

The current basket of goods does not include allowance for uprating, extending or modifying existing infrastructure. We would therefore propose an amendment to the licence condition to accommodate the full range of asset replacement options we are deploying. We would like to follow up this proposal with a meeting to explain these proposals to you in more detail, however, more information to support this proposal is provided in the attached appendices.

Yours sincerely

Alan Kelly
Transmission Commercial and Policy Manager
Network Planning and Regulation

Appendix 1: Background and Drivers leading to the Need for a Change SLC 6F.

SP Transmission's (SPT) RIIO_T1 Business Plan submission (July 2011) was developed using the Energy Networks Strategy Group (ENSG) "blueprint" for the network that had evolved over the previous 5 years. This involved working through the Energy Networks Strategy Group (ENSG) with Ofgem, DECC and other stakeholders to ensure that Scottish, UK and EU government targets for renewable energy could be achieved. The blueprint described three scenarios: "Slow Progression", "Gone Green" and "Accelerated Growth" which the industry used to form the basis of the key plans for network development. These scenarios were subsequently adopted into the Future Energy Scenarios (FES) report of today, which is updated on an annual basis by the System Operator.

Using this blueprint our RIIO-T1 Business Plan forecast an increase in renewable generation of 11GW in Scotland, with 4GW to 8GW connecting within the SPT area. This aligned with the expectations of the Gone Green scenario at that time. We developed a best view of generation connections which comprised 17 projects with a total capacity of 1.62GW that we categorised as relatively certain. Included in this best view are a number of projects that had a degree of uncertainty around whether they will connect during the RIIO-T1 period, or later.

At the time of our submission we were confident that over the course of RII0-T1 we would connect around 2.5GW of additional generation capacity, although approximately 1GW would be subject to substitution of projects from those that reflect our current view. The associated shared use infrastructure required to connect these projects, involved 10 schemes including three "Collector" (larger scale reinforcements) schemes.

In our submission we proposed that any future collector schemes above our baseline would be subject to assessment by OFGEM to consider additional collector funding requirements on a case by case basis. This approach reflected the uncertainty of connecting renewable generation to our network and but, that we would be appropriately funded to meet government targets to connect renewable generation and to serve the needs of generators seeking to connect to our network.

Ultimately, Ofgem fast-tracked our RIIO-T1 submission and included in our licence a baseline allowance for generation connections (also referred to as, Local Enabling (Entry) ') of:

- £68.4m (09/10 prices) to deliver 2,503 Megawatts (MW) of sole use infrastructure.
- £112.2m (09/10 prices) to deliver an installed capacity target of 1,073 megavolt amperes (MVA) of shared use network capacity

This baseline allowance is not specific to individual projects or programmes that were considered at the time of the submission; rather it can be regarded as two portfolios. All expenditure in each portfolio is treated as baseline expenditure until the capacity targets are reached. This recognises that the mix and scope of projects within the baseline may change over time.

In addition to Base Revenues, Ofgem developed a number of uncertainty mechanisms that provide a basis for establishing expenditure allowance for

investment projects whose timing, need and\or scope was not sufficiently certain to be included at the time the baseline allowance was awarded. The uncertainty mechanisms which this application relates is, 'Special Licence Condition 6F' (SLC6F). It concerns the provision of additional generation connection volumes above those included in the baseline capacity targets.

Under SLC6F, the additional allowance generated when the shared use target of 1,073 MVA is exceeded is based on a 'basket of prices' (unit costs) which is applied to the additional assets installed. The additional allowance generated by the SLC6F mechanism is recognised and agreed by Ofgem on delivery of the physical installed capacity of each project that provides an incremental capacity to the network (for example, a substation or kilometres of overhead line).

SPT has terms in its license that dictate how it must respond to parties who apply to connect to its network. SPT cannot discriminate between applicants. Offers for connection must be made to all applicants and charges also must be calculated on the same basis. A quotation on the costs and timescales for connection must be made within the timescales specified in the SO-TO code leading to an offer being made within 90 days of receiving an application.

Those who connect to the transmission network pay only a part of the costs of the connection in accordance with the Connection use of System Code (CUSC). The remaining costs are treated as investment and recovered through regulated revenues. The split between costs paid for by the connecting party and those treated as investment is made up as follows:

Costs Paid by the Customer:

- Connection costs – generally assets at the connection point[1]; and
- One off works – if the customer requests a more expensive solution (for example to replace overhead lines with underground cable) the additional costs are paid by the customer.

Costs Funded as Investment:

Transmission Reinforcement Works are classified as either enabling or wider works. Enabling Works are the minimum transmission reinforcement works which are needed to be completed before a generator can be connected to and given firm access to the transmission system, i.e. between the generator and the nearest suitable point on the network. Enabling Works can be classified as 'Sole' or 'Shared':

- Sole Use Infrastructure – works that are only required for a specific User
- Shared Use Infrastructure - works required to connect a number of Users

The level of costs associated with each of these elements is specific to each connection. Factors such as distance from the existing network, size of connection required and balance between existing load and other generation in the area can all impact on the design of the connection and hence the cost split.

It was recognised by Ofgem, through the introduction of the aforementioned uncertainty mechanism, which the mix and timing of connections that would

[1] *In general, connection assets are defined as those assets solely required to connect an individual User to the SPT transmission system, which are not and would not normally be used by any other connected party (i.e. "single User assets").*

proceed through RIIO-T1 was largely outside of SPT's control. The SLC6F mechanism operates differently depending on whether the asset providing a connection is considered Sole Use Infrastructure (facilitate connection of a single generator) or Shared Use Infrastructure (facilitate connection of more than one generator). This proposal considers only application for Shared Use Infrastructure investment.

In the situations where connection applications require the provision of more than 1,073MVA of Shared Use Infrastructure, additional allowance is provided through SLC6F on the basis of an allowed cost for the specific additional assets ('basket of goods'). The provision of such new build (green field) assets was considered fit for purpose based on the forecast requirements identified in the RIIO-T1 Business Plan. The table below lists the asset categories and the relevant additional allowances that are currently included under this licence:

Description		2009/10 Prices Oncosted (5%) £k	Output MVA		
Substation					
400kV/132kV Substation	2 * 460MVA	23,412	460		
275kV/33kV Substation Transformer Feeder	2 * 120MVA	8,005	120		
275kV/33kV Substation Single Switch	2 * 120MVA	8,459	120		
132kV/33kV Substation Transformer Feeder	2 * 90MVA	6,297	90		
132kV/33kV Substation Single Switch	2 * 90MVA	6,541	90		
Overhead Line					
20km OHL 275kV/400kV Double Circuit L8 Construction		25,450	1710	400kV	Pre Fault
L8 OHL rate per km (+/-) adjustment on 20km cost		1,022	1170	275kV	Pre Fault
20km OHL 132kV Double Circuit L7 Construction		20,180	406	132kV	Pre Fault
L7 OHL rate per km (+/-) adjustment on 20km cost		761			
OHL Synergies Adjustment (Note 1)		936			
Platform Costs					
Removal and processing/disposal of rock	/M^3	0.119			
Removal and off-site disposal of peat	/M^3	0.055			
Haulage road construction	/km	119			

Table 1

For Shared Use Infrastructure beyond the 1,073MVA baseline amount, an allowance is calculated based on these costs. The additional allowance is only made available on energisation of the physical outputs of a project (for example 400/132kV substation) that provide an incremental capacity to the network.

At the time of SPT's RIIO-T1 load submission the best view forecast of transmission connected renewable generation was over 4GW (cumulative), including 2.5GW in the RIIO-T1 period. This forecast included 564MW of generation contracted to connect in the South West Scotland area. In the period since SPT has witnessed a 40% growth, with an additional 791MW contracted in this area alone. In the Coalburn/Linmill area over 800MW is currently contracted to connect compared to approximately 70MW at the time of the original submission. The scale of such change was not reasonably foreseeable at the time of SPT's RIIO-T1 Business Plan submission and has triggered significant "deeper" reinforcement to enable this generation to connect.

The table below illustrates the increased volume of generation connection enquiries since the commencement of RIIO-T1. This has resulted in a much greater volume of contracts, which could not reasonably have been predicted at the outset of the price control:

Generation Connections	2013/14 #	2014/15 #	2015/16 #
Transmission Owner Connection Offers (TOCAs)	52	88	116

Table 2

Whilst there has been significant growth in contracted generation since the start of RIIO-T1, SPT recognise that there remains continued uncertainty on timing due to a number of factors such as planning consents and subsidy. This resulted in the formation of the Transmission Economic Connection Assessment (TECA) Steering Group within SPT. The current contracted position (August 2016) is shown in Table 3, below:

	MW	**MW Consented**
Total Generation	**7,991**	**4,571**
Total Directly Connected Generation (SPT)	3,566	2,959
Total Embedded Generation (SPD)	761	561
Total Offshore Generation (SPT)	3,665	1,050

Table 3

This is almost double the 4MW best view projection identified at the time of the Business Plan submission. It has then undergone further assessment through the TECA Steering Group to arrive at the forecast in Figure 1. It should be noted that the forecast of connections – including embedded generation - drives transmission enabling works, which is why it has been a key area of review.

The role of the TECA Steering Group is to review SPT's best view of the contracted generation background to 2021, to evaluate the timely delivery of transmission reinforcement works, and to better understand the impact on forecast totex and funding. This review is undertaken in a similar manner to the approach identified in SPT's Business Plan and seeks to assign a probability to the likelihood of a scheme proceeding to completion. The assignment of probability is described in the table 4 below:

TECA Assumptions:

High :
- Projects with consent and in construction
- Projects with consent and a date pre-March 2018
- Projects with consent and a date pre-March 2018 and no works

Medium :
- Projects subject to Government Legislation re ROCs
- Subject to information available on project

Low :
- Projects without consent and a date post March 2018
- Assumes that there will be no further CFD for onshore wind

Table 4

The outcome of this assessment under-pin SPT's current forecast, included within the 2015/16 RRP (T2.3a) and is represented graphically below:

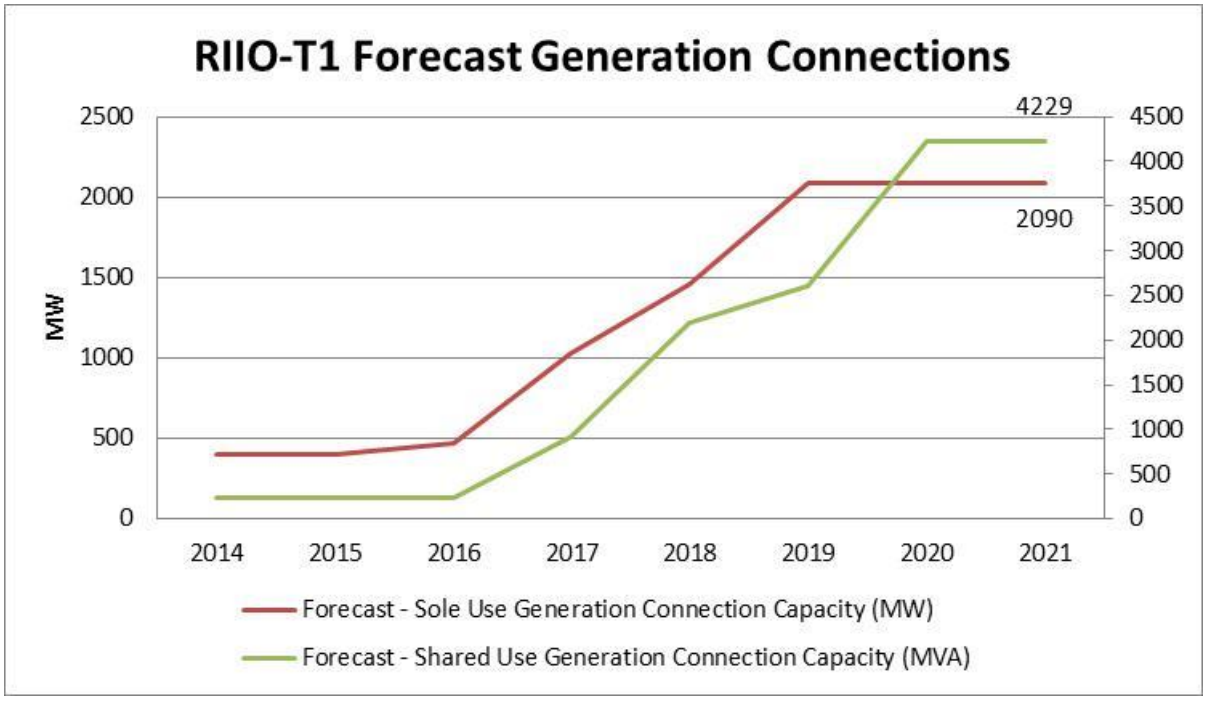

Figure 1

The figures illustrate SPT's revised Best View forecast of 2090MW of directly connected generation counted under SLC6F, based on high probability schemes. The graph does not, however, capture all the relevant generation (approximately 1500MW of embedded generation or generation not requiring enabling works is excluded) that impacts the requirement for reinforcement on the SPT network. The Shared Use Infrastructure forecast remains at a similar level to that which has been advised to Ofgem in prior years' RRPs at 4229MVW. In terms of costs on shared infrastructure we have incurred over the 3 years of the price control a cumulative

total of £129m and forecast an additional £260m by the end of RIIO-T1. A total forecast expenditure of £389m

The disposition of proposed new generation connections has directly led to a significant increase in the scale, scope and type of Shared Use Infrastructure assets required. The technically justified and cost-efficient design solutions that SPT has identified to connect generators includes a mix of traditional and innovative solutions to upgrade and extend existing (brownfield) infrastructure. These solutions can, where applicable, provide a more economic and faster connection compared to new build assets.

The existing provisions under SLC6F do not currently allow for uprating or extension of existing infrastructure. SPT believe that the minor amendments proposed for Table 1 of SLC6F support UK Government energy policy and the drive to 'de-carbonise' the economy by better facilitating the timely connection of new renewable generation. In so doing the inclusion of additional provisions as described under Appendix 2 as follows will provide cost-efficient technical solutions to complement the existing options.

Appendix 2: Proposed Changes to SLC 6F to reflect the full range of Shared Use Infrastructure assets required in RIIO-T1

There are four main amendments to the basket of goods that SPT are proposing:

- Switching substations at 275kV,132kV & 33kV - including bay extensions,
- New build wood pole overhead line at 132kV,
- Re-conductor existing overhead lines at 400/275kV & 132kV,
- Construction of underground cable circuits at 400kV, 275kV, 132kV & 33kV

These elements are required to deliver specific reinforcements necessary connect generation and are detailed by scheme in Table 5 (overleaf). There are 18 schemes listed and 50% (9) are new since the commencement of RIIO-T1.

The schemes referred to are included in SPT's forecast for 2015/16 RRP. They are necessary to deliver the most economic and relevant outputs associated with customer driven schemes and ensure that SPT is compliant with its obligations under the Electricity Act 1989 to develop an economic and coordinated transmission system. In Table 5 below, the proposed amendments are highlighted in ***bold italics***; elements that can be accommodated within the scope of the existing SLC6F are listed in normal font.

The provision of cost estimates for each of the technical solutions will follow, after further consultation with Ofgem. In order to provide further context to the scale of investment, the figures stated are consistent with the forecast provided for the 2015/16 RRP.

The incremental shared use allowance associated with the schemes presented in this paper consists of elements explicitly contained within the SLC6F basket of estimated costs (c63%) and also elements that have been estimated on the basis outlined in Table 5 (c37%). This latter element has an indicative estimated allowance of c£85m (2009/10 prices).

RIIO-T1 - Licence Special Condition 6F : Shared Infrastructure

Power (MVA) & Physical Outputs for Calculation of Project Allowance

Project Details	Licence Output (MVA)	Licence Outputs (Physical)																										
			Substations									Overhead Line									Underground Cable				Platform works			
Project Name	Actual/ Forecast Installed asset rating (MVA) (In accordance with LSC 6F)	RIIO-T1 Baseline	400kV/132kV Substation (460MVA)	275kV/33kV Substation Transformer (2 * 120MVA)	275kV/33kV Substation Single Switch (2*120MVA)	132kV/33kV Substation Transformer (2*90MVA)	132kV/33kV Substation Single Switch (2*90MVA)	275kV DBB AIS 5-bay Switching Substation	275kV DBB GIS 5-bay Switching Substation	132kV DBB AIS 5-bay Switching Substation	132kV DBB GIS 5-bay Switching Substation	20km OHL 275kV/400kV Double Circuit L8 Construction	L8 OHL rate per km (+/-) Adjustment on 20km cost	20km OHL 132kV Double Circuit L7 Construction	L7 OHL rate per km (+/-) Adjustment on 20km cost	IL Synergies Adjustment	132kV Wood Pole construction - per km	Wood Pole adjustment per km (+/-) on 20km cost	132kV L7 OHL Reconductor (£/km)	275kV L8 OHL HTLS Reconductor (£/km)	400kV Cable System (cct/km) related to DC L8 OHL)	275kV Cable System (cct/km) related to DC L8 OHL)	132kV Cable System (cct/km) related to DC L7 OHL)	kV Cable System (cct/km)	Removal and processing/disposal of £/k /M3	Removal and off-site disposal of £/M3	Village road construction/km
Moffat 132kV Substation (TORI 016)	0	Yes	Yes									Yes	Yes															Yes
Moffat 400kV Substation (TORI 015)	240	Yes																										
Gretna - Ewe Hill 132kV OHL circuit (TORI 017)	106	Yes								Yes	Yes						Yes	Yes					Yes					
Crystal Rig - Aikengall II Windfarm (TORI 159)	240	No		Yes																								
Meiklehill 132kV S/Stn to Dunhill 132kV S/Stn (TORI 114)	352	Yes								Yes	Yes			Yes	Yes											Yes		Yes
Dunhill132kV S/s to Blackhill 132kV S/s (Previously Windystandard 132kV collector) (TORI 115)	0	Yes								Yes	Yes				Yes									Yes		Yes		Yes
YY Route Reconductor (TORI 136)		No																		Yes								
Blackhill 132kV Collector S/Stn (TORI 116)	180	Yes				Yes				Yes	Yes																	
New Cumnock 275KV SBB Extension (3rd Transformer; COYL Line CBs & KILS-COYL OHL Uprating) (TORI 142)	240	Yes		Yes																								
Part of * (TORI 142)	0	Yes																		Yes		Yes						
Blackhill 132kV S/Stn to Glenglass 132kV S/Stn (Previously WS Whiteside Hill) (TORI 022)	119	Yes				Yes				Yes	Yes			Yes	Yes									Yes		Yes		Yes
New Cumnock (Meiklehill) - South West Scotland Ph 2 132kV Reinforcement (TORI 111)	240	Yes		Yes										Yes	Yes		Yes	Yes						Yes		Yes		Yes
Coalburn – Linmill No.1 132kV Underground Cable Reinforcement (TORI 155)	150	No																						Yes				
SGT3 240MVA, 400/132kV Transformer at Coalburn Substation (TORI 144)	240	No		Yes				Yes		Yes	Yes																	
Kilmarnock South (TORI 143)	1,000	No	Yes						Yes	Yes	Yes										Yes							
Thornton Bridge_Tornes Cables (TORI 125)	615	No							Yes												Yes							
Coalburn – Kype Muir 132kV Circuit (TORI 181)	180	No								Yes	Yes			Yes	Yes													
Coalburn-Galawhistle Collector Substation 132kV Circuit (TORI 187)	237	No								Yes	Yes			Yes	Yes									Yes				
Ewe Hill 132/33kV Collector Substation (TORI 189)	90	No				Yes																						
Sub-Total (All)	**4,229**																											

Table 5