Quality of Supply Investment

ED2 Engineering Justification Paper Addendum

ED2-NLR(A)-SPEN-001-QOS-EJP-ADD

Issue	Date	Comments
Issue 0.1	Aug 2022	Internal Draft for Review
Issue 0.2	Aug 2022	Internal Draft with Comments Addressed
Issue 1.0	Aug 2022	First Issue - Draft Determination Response

Scheme Name	Quality of Supply Investment			
PCFM Cost Type	Non-Load Related			
Activity	Quality of Supply			
Primary Driver	Network Reliability			
Reference	ED2-NLR(A)-SPEN-001-QOS-EJP-ADD			
Output Type	Quality of Supply			
Cost	**SPD**	£12 349m	**SPM**	£14.057m
Delivery Year	2023-2028			
Reporting Table	CV15			
Outputs included in ED1	~~Yes~~/No			
Business Plan Section	Ensure a Safe and Reliable Electricity Supply			
Primary Annex	Annex 4A.5: Network Performance Strategy			
Spend Apportionment	**ED1**	**ED2**	**ED3**	
	£m	**£26.406m**	**£m**	

	Proposed by	Endorsed by	Approved by
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Date	23.08.2022	23.08.2022	23.08.2022

1 Purpose

This addendum has been prepared to provide additional information and justification to ED2-NLR(A)-SPEN-001-QOS-EJP – Quality of Supply following receipt of RIIO-ED2 Draft Determination. The content of this addendum is in response to comments and feedback provided by Ofgem as to the "Partial Justification" status of the EJP. The purpose of this document is to support Ofgem's assessment for Final Determination including supporting any associated impact on engineering adjustments within Ofgem's financial modelling.

2 Ofgem Comments & Feedback

2.1 RIIO-ED2 Draft Determinations SPEN Annex

The following comments are taken from Table 26 of *"RIIO-ED2 Draft Determination SPEN Annex"*.

Ofgem Comment - Partially Justified. We agree with the needs case for additional Network Control Points. However, we consider that SPEN's proposed intervention volume is uncertain.

Ofgem Identified Risks - There is a risk that the out-turn volumes will differ from the volumes that SPEN have proposed in their submission.

3 Additional Justification

3.1 Summary of any SQs from Draft Submission

As part of SPEN021 SQ Ofgem have queried the proposed Quality of Supply volumes, in particular the combined use of the IIS Circuit Prioritisation model and the Average Time Off Supply (ATOS) model. SP Energy Networks have provided additional detail into the modelling and the resulting volumes of Network Controllable Points (NCPs) to be deployed as part of this programme. A brief explanation of the interaction between the Quality of Supply and the Overhead Line Modernisation programmes was also provided.

As part of SPEN073 SQ, Ofgem have also requested evidence that there is no overlap between the QoS and WSC programmes. Please consult ED2-NLR(O)-SPEN-001-WSC-ADD for information regarding this query.

3.2 Our Response

Both domestic and commercial customers have ranked, as part of SP Energy Networks' RIIO-ED2 stakeholder engagement, speed of restoration after a power cut and not having a power cut as their first and second priorities respectively. Considering the transition to Net Zero, it can be expected that customers' reliance on electricity will increase, magnifying the importance of these top two priorities.

As explained in Section 5.1 of the EJP, a granular network performance forecasting model was developed at an HV circuit level. The future likelihood of failure was based on 40% historical performance of that circuit and 60% network average performance, split by length of overhead line and underground cable.

The model adds NCPs incrementally on each circuit, calculating the CI and CML benefits of each addition. The optimum number of NCPs is reached when the net benefit is maximised. The result of this modelling is a prioritised list of HV circuits, with an optimum intervention for each. This optimum number of NCPs is validated using the ATOS model. This is a balanced approach that results in 1,027 NCPs to be installed in SP Manweb and 1,126 NCPs to be installed in SP Distribution.

Based on the modelling, each HV circuit is assigned a number of optimal NCPs that need to be installed in order to maximise benefits. However, in many cases it will be impossible to install the assigned number of NCPs on a given circuit, creating a potential deliverability risk. This is due to several factors including network topology and suitability of switchgear for retrofitting. To mitigate this risk, a detailed engineering design will be carried out for each circuit, with the aim of deploying as many of the assigned number of NCPs at the most beneficial locations.

The detailed design will endeavour to split a circuit by deploying NCPs into as even as possible customer numbers. This requires deploying NCPs at substations so that the customers connected can have their supplies restored through either side of the circuit. Installing NCPs at normally open points is a pre-requisite for this and is included within the volumes in the plan. Where it is not possible to split customers, such as in the case of a heavily loaded spur line or substation, the same approach of deploying NCPs such that supplies can be restored through either side of the circuit will be applied. The aim will be to achieve the optimum customer split, which is calculated as the total number of customers divided by the total number of NCPs (existing plus optimal additions).

When customers can no longer be split optimally, yet NCPs can still be practically deployed to derive customer benefits, existing plant will be targeted. Both ground-mounted and pole-mounted switchgear will be retrofitted with NCPs where compliant, and pole-mounted switchgear will be considered for complete replacement when not compliant.

After the detailed engineering design has been completed, an assessment will be made of how many NCPs from the optimal number could not be installed. The remaining volumes will be carried over to the next HV circuit on the prioritised list. As detailed in Section 5.1 of the EJP, the proposed volumes were the aggregate of two different methods, with a slight bias given to the method that produced the larger value. This accounts for left-over volumes, which will therefore be installed in addition to the optimal number of NCPs on subsequent HV circuits lower on the prioritised list. This will be done up to a limit given by whichever one of the two methods that produces the largest value of additional NCPs.

Furthermore, despite the programme being based on the deployment of NCPs, other interventions may be proposed in some cases, depending on the detailed engineering design. For example, undergrounding portions of overhead line may be undertaken on a given circuit in addition to NCP deployment. This would not only deliver extra benefits; it would also reduce the volumes of remaining NCPs that may have been carried over from previous interventions.

The methods described in the two above paragraphs provide ample opportunity to install the proposed NCP volumes and deliver customer benefits. As such, the remaining volumes will be absorbed into the programme, thus mitigating the risk of under-delivery.

4 Appendix

The content of this appendix has been redacted.