



## **DCUSA Consultation**

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DCP 172 - Clarification of way in which voltage rise is used in determining the New Network Capacity

## 1 PURPOSE

- 1.1 The Distribution Connection and Use of System Agreement (DCUSA) is a multi-party contract between electricity Distributors, electricity Suppliers and large Generators. Parties to the DCUSA can raise Change Proposals (CPs) to amend the Agreement with the consent of other Parties and (where applicable) the Authority.
- 1.2 This document is a consultation issued to all DCUSA Parties, Distribution Network Operators (DNO), Independent Distribution Network Operators (IDNO), Suppliers, Customers, any other interested Parties and the Authority in accordance with Clause 11.14 of the DCUSA seeking industry views on DCP 172 '*Clarification of way in which voltage rise is used in determining the New Network Capacity*' (Attachment B).
- 1.3 Parties are invited to consider the proposed legal text set out in Attachments C - G and submit comments using the response form provided as Attachment A to [DCUSA@electralink.co.uk](mailto:DCUSA@electralink.co.uk) by **Tuesday, 01 September 2015**.

## 2 DCP 172 – CLARIFICATION OF WAY IN WHICH VOLTAGE RISE IS USED IN DETERMINING THE NEW NETWORK CAPACITY

- 2.1 DCP 172 has been raised by SP Energy Networks following discussions at the Connections Charging Methodology Forum (CCMF).
- 2.2 The current Common Connection Charging Methodology (CCCM), governed under Schedule 22 of DCUSA, determines whether and to what extent the costs of network Reinforcement are apportioned (shared) between the connecting customer(s) and the DNO. Reinforcement is defined in DCUSA as “assets installed that add capacity (network or fault level) to the existing shared use Distribution System”.
- 2.3 In relation to situations where the costs of Reinforcement “are driven by either thermal capacity or voltage (or both) as assessed against the relevant standard”, the Methodology states that the Security Cost Apportionment Factor (CAF) rule determines the proportion of the Reinforcement costs which are chargeable to the customer.
- 2.4 The current definition of New Network Capacity within the Security CAF calculation

- makes reference to Voltage Drop. Voltage Drop is applicable to demand connections however when evaluating the impact of a Distributed Generation (DG) connection to the distribution network, it is instead necessary to consider voltage rise caused by connection of the DG. This often involves the installation of assets in order to keep the voltage rise caused by the DG within acceptable or statutory limits.
- 2.5 As the current approved Methodology currently does not explicitly state how costs should be apportioned for Reinforcement which is driven by DG voltage rise, there are differing approaches used by DNOs for assessment of the Security CAF.
- 2.6 Under the current definition of New Network Capacity, when using the voltage rise capacity as the denominator in the Security CAF calculation, there are occasions where the customer uses all of the additional DG capacity created and is apportioned all of the Reinforcement costs.<sup>1</sup> However, some DNOs do not currently use the voltage rise capacity limit within the CAF calculation.
- 2.7 This change seeks to add further clarity to the Methodology to the way in which voltage rise influences the calculation of New Network Capacity within the Security CAF. A number of options for appropriate CAF assessment are discussed within this consultation, which seeks views to assist in the development of a recommended approach for consistent application by all DNOs.

### **3 WORKING GROUP ASSESSMENT**

- 3.1 The DCUSA Panel has established a DCP 172 Working Group which was set up to consist of Customers, DNO and Ofgem representatives.
- 3.2 The Working Group considered that the limited change proposed in the CP to the legal text, amending 'voltage drop' to 'voltage change' in the New Network Capacity

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<sup>[1]</sup> The voltage rise capacity is the maximum capacity of distributed generation that may be connected with the network remaining within its upper statutory or other voltage limit. In some cases it will only be necessary to reinforce part of a circuit length in order to accommodate the new distributed generation connection and maintain the network within the upper voltage limit. In such cases and where the new connection is the only distributed generation being connected to the network then normally the 'new network capacity' (denominator) in the CAF would equal the 'required capacity' (numerator) and the customer will be charged 100% of the reinforcement costs.

definition, could still result in varying approaches by DNOs to how they apply apportionment to Reinforcement caused by voltage rise.

3.3 The Working Group is in agreement that introducing an amendment to the New Network Capacity definition would provide further clarity to the Methodology and limit the scope for alternative approaches to be applied. Furthermore the Working Group considered the intent of the change and agreed that it was within the scope of this change to provide Examples of scenarios where voltage rise occurs and how the calculation is treated. The Working Group identified four Options which could potentially act as solutions to the issue. The proposed examples for each of the Options are as shown in Attachments C, D, E & F.

3.4 The Working Group considered that any changes introduced by DCP 172 would need to leave the Connection Charging Methodology compliant with SLC 14.

3.5 The four Options which the Working Group identified are described below:

- The first Option is to apply within the Security CAF calculation capacity values determined through application of voltage rise criteria (which in some cases apportions 100% of the cost to the connecting customer).
- The second Option is to apply within the Security CAF calculation a thermal capacity calculation where voltage rise occurs (which would normally apportion the costs between the DNO and the connecting customer).
- The third and fourth Options introduce a new concept of an exception to Option 1 by recognising situations where the reinforced network could benefit other customers for future new connections. In such cases, it may be more appropriate to apportion the cost of the connection on the basis of thermal capacity parameters.
  - Under Option 3 the Security CAF calculation will be based on thermal criteria if all of the four conditions below are satisfied.

The Reinforcement:

- requires installation of a Substantial Asset; and
- requires installation of a Complete Asset; and

- provides connection to a Demand Dominated Network; and
- normally provides connection to a number of customers in excess of the Number of Customers Threshold.

- The new terms used in these four conditions are defined as

<b>Substantial Asset</b>	Assets with a thermal rating at or in excess of the following in relation to the highest operating voltage:  LV: 100kVA  HV and above: 500kVA
<b>Complete Asset</b>	For circuits, means an asset installed from the circuit originating substation to the end of the circuit. Where a circuit is interconnected and relies on such interconnection for its compliance with security of supply standards it is the entirety of all dependent interconnected circuits from the originating substation(s).  For substations, means all the assets required to achieve secure capacity, as applicable.
<b>Demand Dominated Network</b>	Where our assessment is that the maximum demand exceeds the maximum generation (this will be a separate assessment of maximum demand and maximum DG conditions, inclusive of diversity)
<b>Number of Customers Threshold</b>	Means where the number of customers normally connected to the asset is in excess of:  LV assets: 10  HV and above assets: 20

If any of the four conditions above are not satisfied, the capacity values used in the Security CAF calculation must be determined on the basis of voltage rise considerations.

- Under Option 4 the Security CAF calculation will be based on thermal criteria if the two conditions below are satisfied.

**The Reinforcement:**

- requires installation of a Complete Asset or Assets; and
- provides connection to a Demand Dominated Network
  - The new terms used in these two conditions are defined as

<b>Complete Asset</b>	Asset which is HV and above
<b>Demand Dominated Network</b>	Where our assessment is that the maximum demand exceeds the maximum generation. (this will be a separate assessment of maximum demand and maximum DG conditions, inclusive of diversity)

If either of the two conditions above is not satisfied, the capacity values used in the Security CAF calculation must be determined on the basis of voltage rise considerations.

- 3.6 One member of the Working Group has concerns that customer representatives are not included in the DCUSA voting process and believes that this results in customer views having no effect. Whilst the views of this member are included in this consultation document the member has now withdrawn from the Working Group.

#### 4 APPLICATION RULE OPTIONS FOR CIRCUMSTANCES WHERE VOLTAGE RISE OCCURS

4.1 The Working Group identified the following Options for establishing the application rules for circumstances where the network is reinforced due to voltage rise to accommodate a connection to the network. This table sets out the Working Group's assessment of the advantages and disadvantages of each Option.

Table 1		
Options	Advantages	Disadvantages
<b>Option 1</b>  Capacity values in CAF calculation only based on voltage rise criteria	<ul style="list-style-type: none"> <li>• Simple to apply</li> <li>• Where a Complete Asset such as a transformer is replaced then the CAF is less than 100%</li> <li>• Reinforcement works and costs sized only to meet the connecting customers requirement</li> <li>• Greater transparency of application than Options 3 and 4</li> </ul>	<ul style="list-style-type: none"> <li>• Where only part of a circuit is reinforced, then CAF normally = 100%</li> <li>• Gives no credit for the additional thermal capacity that results</li> <li>• Where this approach results in 100% charge to the connecting customer it may appear unfair that no credit is even given for recovered apparatus and no acknowledgement of any deferral of renewal.</li> <li>•</li> </ul>
<b>Option 2</b>  Capacity values in CAF calculation only based on thermal capacity ratings	<ul style="list-style-type: none"> <li>• Simple to apply</li> <li>• Reduces the Cost Apportionment Factor for the connecting customer</li> </ul>	<ul style="list-style-type: none"> <li>• In some cases does not reflect that the extent of Reinforcement has been limited to that necessary to provide the new connection.</li> </ul>

	<ul style="list-style-type: none"> <li>• It may reflect that additional capacity is available for other customers</li> <li>• Greater transparency of application than Options 1, 3 and 4</li> </ul>	
<p><b>Option 3</b></p> <p>If the four conditions below are satisfied, thermal capacity ratings apply in the CAF calculation.</p> <p>Where the Reinforcement:</p> <ul style="list-style-type: none"> <li>• involves a Substantial Asset; and</li> <li>• involves a Complete Asset; and</li> <li>• provides connection to a Demand Dominated Network; and</li> <li>• normally provides connection to a number of customers in excess of the Number of Customers Threshold.</li> </ul> <p>If any of the four conditions above are not satisfied, the capacity</p>	<ul style="list-style-type: none"> <li>• Attempts to give the customer the benefit of the thermal CAF when a network benefit is realised</li> <li>• Recognises the likelihood of future benefit to other parties</li> </ul>	<ul style="list-style-type: none"> <li>• Complicated to apply in practice and it may not be clear if the a total asset has been replaced</li> <li>• It appears to not recognise network benefits provided for future DG connections but only where it is a demand dominated network</li> <li>• If they do not meet the 4 criteria then there will still be 100% apportionment in some cases</li> <li>• It introduces four new definitions that will not otherwise be used within the Methodology</li> <li>• Greater complexity than Options 1 and 2</li> </ul>



values must be based on voltage rise considerations.		
<p><b>Option 4</b></p> <p>If the two conditions below are satisfied, thermal capacity ratings apply in the CAF calculation.</p> <p>Where the Reinforcement:</p> <ul style="list-style-type: none"> <li>• Involves a Complete Asset (is an asset which is HV and above); and</li> <li>• provides connection to a Demand Dominated Network</li> </ul> <p>If either of the two conditions above is not satisfied, the capacity values must be based on voltage rise considerations.</p>	<ul style="list-style-type: none"> <li>• Simple and more easy to apply arrangement than option 3</li> <li>• The mitigation issues from the definitions are reduced to some effect</li> </ul>	<ul style="list-style-type: none"> <li>• Two new definitions which are not definitely applicable across a range of examples</li> <li>• Greater complexity than Options 1 and 2</li> </ul>

## 5 ASSESSMENT AGAINST THE DCUSA OBJECTIVES

- 5.1 The Working Group has reviewed the CP against the DCUSA Objectives and is in agreement with the proposer of the CP that DCP 172 better facilitates DCUSA General Objective 1 & 3 and DCUSA Charging Objective 1 by adding further clarity to the CCCM.

## 6 LEGAL DRAFTING

- 6.1 The original draft legal text proposed that the word “drop” is replaced with the word “change” in the New Network Capacity definition in Schedule 22 of DCUSA to accommodate this proposal. The suggested legal drafting for each Option is provided as Attachments C - F.

<b>New Network Capacity</b>	<p>is the secure capacity of the Relevant Section of Network following Reinforcement. This is our assessment of the resultant capacity and will be considered in respect of thermal capacity, voltage change and upstream restrictions and compliance with our relevant design, planning and security of supply policies. The equipment ratings to be used are the appropriate operational rating at the time of the most onerous operational conditions taking account of seasonal ratings and demand.</p>
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- 6.2 Further legal drafting has been proposed if Option three or Option four is the preferred solution to this change which is detailed below:

### Option Three

#### **New Clause 1.26**

For generation connections, where Reinforcement is only required to keep the voltage rise within acceptable limits, the voltage rise limit will be used to calculate the New Network Capacity except where the Reinforcement:

- requires installation of a Substantial Asset, and
- requires installation of a Complete Asset, and
- provides connection to a Demand Dominated Network, and

- normally provides connection to a number of customers in excess of the Number of Customers Threshold

**New definitions: Schedule 22 Clause 1.24**

Substantial Asset	Assets with a thermal rating at or in excess of the following in relation to the highest operating voltage:  LV: 100kVA  HV and above: 500kVA
Complete Asset	For circuits, means an asset installed from the circuit originating substation to the end of the circuit. Where a circuit is interconnected and relies on such interconnection for its compliance with security of supply standards it is the entirety of all dependent interconnected circuits from the originating substation(s).  For substations, means all the assets required to achieve secure capacity, as applicable.
Demand Dominated Network	Where our assessment is that the maximum demand exceeds the maximum generation (this will be a separate assessment of maximum demand and maximum DG conditions, inclusive of diversity)
Number of Customers Threshold	Means where the number of customers normally connected to the asset is in excess of:  LV assets: 10  HV and above assets: 20

Option Four

**New Clause 1.26**

For generation connections, where Reinforcement is only required to keep the voltage rise within acceptable limits, the voltage rise limit will be used to calculate the New Network Capacity except where the Reinforcement:

- requires installation of a Complete Asset, and
- provides connection to a Demand Dominated Network.

**New definitions: Schedule 22 Clause 1.24**

Complete Asset	HV and above assets
Demand Dominated Network	Where our assessment is that the maximum demand exceeds the maximum generation (this will be a separate assessment of maximum demand and maximum DG conditions, inclusive of diversity)

6.3 A series of Examples have been drafted to demonstrate each proposed Option in practice. Beneath the Example there is a charging calculation for each Option consistent with the Methodology approach. These Examples are provided in order to indicate to respondents the level of impact of each Option and the cost and are set out in the legal text which acts as Attachments C - F.

## 7 IMPLEMENTATION

7.1 The proposed implementation date for DCP 172 is the next DCUSA release following Authority consent.

## 8 CONSULTATION

8.1 The Working Group is seeking views on the below questions:

1. Do you understand the intent of the DCP 172?
2. Are you supportive of the principles of the DCP 172?
3. Options 1-4 have been set out in table 1 of this consultation. Which Option do you prefer and why?
4. Options 1-4 have been set out in table 1 of this consultation. Which Option would you definitely not support and why?
5. Do you support Option 1 to always apply the voltage rise method?
6. Can you identify any additional advantages or disadvantages to Options 1-4 that are not captured in table 1 of this consultation? Please comment.
7. Do you agree with the high level approach of Option 3?

8. If you are in agreement with the high level approach of Option 3, do you agree with the detail of this approach? Please provide any alternative methodology which could be employed.
9. Do you agree with use of the consideration of a substantial asset and if so would you have any alternative way of defining this term?
10. Do you agree with use of the consideration of a complete asset and if so would you have any alternative way of defining this term?
11. Do you agree with use of the consideration of a Demand Dominated Network?
12. Do you agree with use of the consideration of a Number of Customers Threshold?
13. Do you consider that Option 3 is more appropriate than Option 4? Please explain.
14. Do you consider that Option 4 is more appropriate than Option 3? Please explain.
15. What are the potential costs of this change? Which option for your organisation would have the lowest or highest cost?
16. Are you supportive of DCP 172 being implemented at the next DCUSA release following Authority consent?
17. Which DCUSA General Objectives does the CP better facilitate? Please provide supporting comments.
  1. The development, maintenance and operation by each of the DNO Parties and IDNO Parties of an efficient, co-ordinated, and economical Distribution System.
  2. The facilitation of effective competition in the generation and supply of electricity and (so far as is consistent with that) the promotion of such competition in the sale, distribution and purchase of electricity.

3. The efficient discharge by each of the DNO Parties and IDNO Parties of the obligations imposed upon them by their Distribution Licences.
  4. The promotion of efficiency in the implementation and administration of this Agreement and the arrangements under it.
  5. compliance with the Regulation on Cross-Border Exchange in Electricity and any relevant legally binding decisions of the European Commission and/or the Agency for the Co-operation of Energy Regulators.
18. Which DCUSA Charging Objectives does the CP better facilitate? Please provide supporting comments.
1. that compliance by each DNO Party with the Charging Methodologies facilitates the discharge by the DNO Party of the obligations imposed on it under the Act and by its Distribution Licence
  2. that compliance by each DNO Party with the Charging Methodologies facilitates competition in the generation and supply of electricity and will not restrict, distort, or prevent competition in the transmission or distribution of electricity or in participation in the operation of an Interconnector (as defined in the Distribution Licences)
  3. that compliance by each DNO Party with the Charging Methodologies results in charges which, so far as is reasonably practicable after taking account of implementation costs, reflect the costs incurred, or reasonably expected to be incurred, by the DNO Party in its Distribution Business
  4. that, so far as is consistent with Clauses 3.2.1 to 3.2.3, the Charging Methodologies, so far as is reasonably practicable, properly take account of developments in each DNO Party's Distribution Business
  5. that compliance by each DNO Party with the Charging Methodologies facilitates compliance with the Regulation on Cross-Border Exchange in Electricity and any relevant legally binding decisions of the European Commission and/or the Agency for the Co-operation of Energy Regulators.

19. Do you have any comments on the proposed legal text for DCP 172?
20. Are there any alternative solutions, refinements to any of the proposed solutions or any other matters that should be considered by the Working Group?

Responses should be submitted using Attachment A to [DCUSA@electralink.co.uk](mailto:DCUSA@electralink.co.uk) no later than **Tuesday, 01 September 2015**. Responses, or any part thereof, can be provided in confidence. Parties are asked to clearly indicate any parts of a response that are to be treated confidentially.

## 9 NEXT STEPS

- 9.1 Responses to the Consultation will be reviewed by the DCP 172 Working Group. The Working Group will then determine the progression route for the CP.
- 9.2 If you have any questions about this paper or the DCUSA Change Process please contact the DCUSA Help Desk by email to [DCUSA@electralink.co.uk](mailto:DCUSA@electralink.co.uk) or telephone 020 7432 3017.

## 10 ATTACHMENTS

Attachment A – DCP 172 Response form

Attachment B – DCP 172 Change Proposal

Attachment C – Option 1 - DCP 172 Draft Legal Text – R1

Attachment D – Option 2 - DCP 172 Draft Legal Text – R1

Attachment E – Option 3 - DCP 172 Draft Legal Text – R1

Attachment F – Option 4 - DCP 172 Draft Legal Text – R2

Attachment G – DCP 172 Proposed Legal Text